Vol. 6 JANUARY, 1932

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# THE PSYCHIAT QUARTE

SUCCESSOR TO THE STATE HOSPITAL QU

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# REVIEW OF THE WORK OF THE PYCHIATRIC INSTITUTE AND HOSPITAL DURING THE PAST YEAR*

BY CLARENCE O. CHENEY, M. D.,
DIRECTOR, NEW YORK STATE PSYCHIATRIC INSTITUTE AND HOSPITAL

In welcoming the members of the conference to the Institute today we are sorry that this greeting is not extended to you by Dr. Kirby as director, as it was last year. I know that everyone here regrets his retirement from the directorship of the Institute but none more so that your present speaker. We are happy in the fact, however, that through Dr. Kirby's retention of the professorship of the department of psychiatry in the College of Physicians he maintains his previous interests and we thus have the pleasure of continued association with him.

As was indicated by Dr. Kirby last year, it is our hope that these December meetings at the Institute will come to be an established annual event. We should be pleased, at such times, to present to the conference a review or a summary of the year's work in the various fields in which we are active in order to acquaint the members of the Department with the nature and aims of these activities and to seek from the members in the Department that interest and cooperation which is so necessary for the furtherance of our work.

In considering a survey of the activities of the Institute one is met at once with the difficulty in a presentation of activities from the standpoint of the various departments, because of the practically constant interrelation of the various departments in their respective activities. Considering, however, the work of the Institute and Hospital from that aspect which the patient meets in his first contact with the hospital, we may first mention some of the activities of the out-patient department.

The out-patient department is in charge of the senior psychiatrist who devotes all of his time to the work connected with this department. The members of the Institute clinical staff are assigned to certain hours during the week in the out-patient department. We have the advantage of the services, in addition, of ten outside practicing physicians who take certain hours in the clinic and contribute very materially by their services to the work accomplished by

* Read at the Quarterly Conference of the New York State Department of Mental Hygiene at the Psychiatric Institute and Hospital, New York City, December 15, 1931.

the clinic. More recently arrangements have been made, through the cooperation of several superintendents of the State hospitals, to increase the clinic staff by having individual physicians from these State hospitals assigned for an afternoon a week to the clinic activities. We feel that this arrangement is not only of benefit to the Institute but, we hope, will be of material advantage to hospital physicians who thereby will come in contact with problems in both adults and children which their hospital experience may not have afforded and with different problems of treatment to be met.

The clinic operates on an appointment system, eliminating crowding and unnecessary waiting. This provides physicians with a daily schedule which not only makes it more agreeable for the patient but permits the physicians to work in a more orderly and systematic manner. In the past fiscal year ended June 30, 1931, 611 adults and 200 children or a total of 811 persons were treated in the out-patient department. The sources from which these patients are referred are numerous; a larger number come from outside physicians and from the Medical Center, or are referred by friends, parents and relatives, social agencies and schools. During the year 258 sessions of the out-patient clinic were held, the doctors making 1,508 visits; the total number of visits made by patients was 3,469. In 244 adult patients the diagnosis was psychoneurosis or neurosis; 122 adults were looked upon as having a dementia præcox type of reaction and 63 manic-depressive type of reaction; 41 were cases of general paralysis.

Of the children, 16 were looked upon as psychoneurotic, 15 as suffering from dementia præcox, but the large majority, 148, were for statistical purposes classified as without psychoses. In most, if not all, of these instances, there were one or more psychiatric problems and this situation brings forcefully to our attention the desirability, for statistical purposes, of attempting to classify the various types of problems that are seen in children who attend the clinic.

The hospital through the out-patient department affords consultation services to the various divisions of the Medical Center. Such consultations during the first 9 months of the past fiscal year numbered 53. During the recent 5 months, however, the number was 45. Problems of diagnosis and treatment are discussed at such

consultations, as is also the question of admission to the Institute for hospital care.

During the past fiscal year 348 patients were admitted to the hospital department of the Institute. It is interesting to note that this number is identical with that of admissions to the Gowanda State Hospital and is only 42 less than the number of admissions to the Middletown State Hospital. The total number of patients under treatment during the year was 434. Of those admitted during the year, 287 patients entered upon a voluntary basis and 14 were admitted on physician's certificates. No patients were committed directly to the hospital. In determining whether a patient shall be admitted to the hospital department, various factors are taken into consideration. It is understood that the hospital is primarily the research and teaching division of the Department of Mental Hygiene and its primary function is not that of care and treatment of patients. To carry out the teaching function, patients are selected not only from the standpoint of symptoms of so-called mild mental disorders that may be met by the medical student after he has been graduated into practice, but also to give experience with the symptomatology and treatment of a rather wide variety of psychiatric conditions. From a research standpoint the patients are selected according to the problems that are of immediate concern in investigation. To round out the clinical material avilable for these purposes, 47 patients were transferred during the year from the State hospitals.

During the fiscal year 275 patients were discharged; 26, or approximately 10 per cent, of these were considered recovered and 86, or somewhat over 30 per cent, were considered improved during their hospital residence. Forty-eight patients, or 17 per cent, of those discharged had a residence of less than one month. Twenty-eight per cent were in the hospital for a period of between one and three months. Among the admissions to the hospital there were 42 cases of general paralysis, 36 of the manic-depressive reaction, 60 of dementia præcox reaction and 42 were considered to be psychoneurotic. The diagnoses of the other patients were scattered through the various groups, the organic brain reactions, except general paralysis, being only occasional. During the year there were

three deaths, two occurring in cases of general paralysis and one in a patient with a manic-depressive excitement.

During the five months' period ending December 1, a total of 160 patients were admitted, 143 of these being on a voluntary basis; 163 patients were discharged; 156 patients were in the hospital on December 1. The larger number of vacancies is found on the children's service for which it is considered important to select carefully patients for admission in view of the administrative problems and the limited classification facilities available. Experience has shown that children require classification not only because of age but also according to behavior.

During the fiscal year ending June 30, 73 children were admitted to the hospital, the ages ranging from 4 years to 16 years with the larger number between the ages of 10 and 14 years. An entire floor of the Institute is given over to the children's service and provides accommodations for 32 beds, a play room, school room, occupational therapy shop, serving pantries and dining rooms. Children receive their recreational activities in the indoor or outdoor gymnasiums and through visits to museums, zoos and other centers of interest to children. When weather permits, outdoor picnics are held during the spring and fall months. School is on a regular schedule and is conducted under the direction of a special teacher assigned by the Board of Education of the City of New York. The children also have a regular schedule of occupational therapy and manual training. Because of the lack of outdoor recreational facilities in connection with the hospital and because of the cessation of the school program, it has been considered inadvisable to attempt to retain in the hospital the full quota of children during the summer months. Through the assistance of the social service department many of the children previously in the hospital were sent to camps for the summer. The need is felt for a permanent summer camp for the use of the Institute service, within a drive of one hour or two hours from the Institute. We should be glad to have consideration given to this problem by those who might have facilities to offer.

Approximately 50 per cent of the children admitted and treated the hospital have been found to be suffering from an organic type of reaction. The remainder were psychoneurotic or schizophrenic

reactions, or other personality deviations which caused problems in the home, school or community.

Several research projects that have been of major interest during the past year may be briefly mentioned. First, we may note the radiotherm treatment of general paresis. Up to the present time 65 patients have completed this treatment. We do not feel that a sufficiently large number of patients has been treated or that sufficient time has elapsed since the completion of treatment to arrive at final conclusions regarding the efficacy of this form of therapy. However, a tentative survey of 60 patients whose treatment was completed not less than six months ago tends to show that 17 per cent of these patients have obtained good remissions; 6 per cent have died; 34 per cent were improved and 43 per cent, unimproved. It is to be understood that these figures are quite tentative. It appears, however, that radiothermy may not bring about as high a percentage of remission as treatment by malaria or tryparsamide. It has the distinct advantage, however, in that no patient is found to be resistant to such treatment as some patients are with malaria; the treatment is always available and does not require a continued series of patients such as malaria requires. On the other hand, because of the necessity of the passive cooperation of the patient during the treatment in the apparatus it has not been found feasible to treat in this manner, disturbed, over-active paretics. The patients require, also, more constant immediate attention during the paroxysm of fever than do malarial patients because of the necessity of careful attention to avoid hyperpyrexia; the observation of the temperature at least every half hour and preferably every 15 minutes over a period of 7 to 8 hours is necessary.

Through the cooperation of Dr. A. L. Barach of the Presbyterian Hospital, who has provided the necessary oxygen chamber, other apparatus and the oxygen, out of private funds, we have been able to carry out an investigation of oxygen treatment of patients showing dementia præcox reactions. The rationale of the treatment was based upon certain evidence that in this form of reaction there may be deficient oxygenation and also on the evidence that comparatively normal persons deprived of oxygen may show irritability and paranoid reactions. Patients selected for this research are examined from psychiatric and biochemical viewpoints before

treatment and are then placed in a chamber of small-room size in which there is introduced an atmosphere of approximately 50 per cent oxygen and 2 to 3 per cent carbon dioxide. The patients live in this chamber for a period of approximately two months, being removed daily for treatment by inhalation of 12 to 15 per cent carbon dioxide for a period of 10 to 15 minutes. This carbon dioxide treatment as well as the introduction of carbon dioxide into the oxygen of the chamber is based on the assumption that the presence of carbon dioxide increases the tissue absorption of oxygen.

Periodic psychiatric and biochemical studies are made during the period of treatment. We are not prepared to indicate final results at this time as only seven patients have recently completed this form of treatment. It may be said, however, that a number of these patients have shown improvement during treatment and subsequent to treatment. Because of the psychological factors involved in the regime of the treatment and the change from the treatment regime to the more open-ward regime, we do not feel able to evaluate at the present time changes that may have taken place.

A cooperative research program for the study of catatonic schizophrenia is being carried out. On these selected patients, in addition to a thorough psychiatric survey, bacteriological, biochemical and special psychological studies are progressed in a systematic manner. The full resources of the Institute are combined in the study of this important problem with the object of determining all possible knowledge about this type of individual patient, with the ultimate aim of ascertaining the etiological factors, the mechanisms at work and the best indicated methods of treatment.

The dental department serves both the hospital and out-patient divisions. All admissions have a thorough dental survey made, and indicated treatment is carried out. Particular attention has been given to the repair and correction of dental deformities. Special investigation of the relation of nutrition to dental caries in children is being carried out.

The occupational therapy department began the fiscal year with 55 patients under treatment and closed the year with 119 under treatment. During the entire year the department had under its

care 375 patients (323 adults and 52 children). Eight daily classes in arts and crafts and manual training are conducted, and a daily schedule of classes in physical education is carried out for all patients for whom this treatment is prescribed. These activities cover calisthenics and competitive games, including basketball and indoor baseball. Dances with orchestral music are held regularly for the patients, and on holidays special entertainments in which the patients take a most active part are presented.

The social service department directs its activities to both the out-patient and hospital divisions. In each division the social problems involved in the individual case and a program of work are discussed with the physician and worker. It is the plan to have these social problems determined as soon as possible after admission so that the worker may develop an early contact with the patient, family or other persons concerned. The activities of the department cover thorough environmental studies, the obtaining of supplementary information, and the social rehabilitation of the patient, in cooperation with community agency workers where patients have been referred by, or in contact with, such agencies. Some conception of the amount of activity may be gotten from the statement that during the last fiscal year the average number of new cases opened monthly was 17; the average number of cases under active care during a month was 73; and the monthly average number of interviews at the hospital was 202, with an average of 86 interviews outside the hospital.

Through an arrangement with the New York School for Social Work, the social work students of that school are assigned to the Institute for their field work. These students, who now number 12 and who spend three to five days a week at the Institute for a period of six to nine months are under the immediate direction of two supervisors who are financed by the school, all of the work, however, being under the general direction of the Institute head worker. The students thus have an unusual opportunity for desirable training in case work, and the Institute benefits by the assistance the students are able to render in social work with its patients.

Time does not permit a detailed description of the work of the various research departments. Some of these have already been mentioned in connection with the cooperative research clinical prob-

lems. We may indicate a few of the other projects with which the departments have been concerned.

The associate in internal medicine has continued to act as consultant to the clinical department in problems of medical care and treatment, in addition to carrying out special investigations singly or in cooperation with other departments. Special investigation has been made of anterior pituitary luetinizing hormone preparation in cases with gonadal deficiency, in menstrual disturbances, and involution melancholia, with also a study of immune bodies produced in these patients. Basal metabolism and blood changes in sodium amytal narcosis have been investigated.

Studies regarding sensitization and immune body formation are being carried out with the departments of bacteriology and serology. Since in certain cases of allergy, substances to which the patients are sensitive may be extracted from the urine, some cases at the Institute are being examined from this standpoint with the possibility that allergy may be an underlying etiological factor.

Since it is claimed that proteins occurring under some conditions in the urine may arise from certain specific organs such as the liver, the work is being extended to immune body formation for specific organs. Some recent studies indicate that this may play a very important role in various pathological and immunological processes.

The effect of picrotoxin (an active medullory stimulant) is being studied in certain retarded patients. The effect on the gross reaction, metabolic changes such as oxygen consumption, lactic acid formation, etc., are being investigated.

Cardiotachometer studies during sleep, stupor and effects of drugs have been started.

The department of psychology, in addition to its cooperative studies in catatonia, which include the photography of postural changes during sleep in these patients, has studied the effects on emotion of injections of adrenalin in various psychotic reactions. The department is making special psychological studies of patients with general paralysis in the pre-treatment, treatment, and post-treatment periods. In cooperation with the department of psychology of the University, there is being made a series of mental and physical measurements during deprivation of oxygen similar to

that deprivation found at high altitudes, a normal control group to be compared with a group of mental patients who show abnormal fatigue symptoms. Two voluntary research students are contributing to the work of the department.

Psychometric studies are conducted by the department on psychotic patients. Such studies, however, are more in the nature of research than of routine procedure to be carried out with each patient.

In addition to the work carried out by the chemical department in cooperation with the other associates in clinical research, this department has carried on investigations of non-fermentable reducing substances in the spinal fluid, of creatine and its synthesis, and of proteins of the brain, the last topic being studied in cooperation with Dr. R. J. Block, holder of a traveling Yale fellowship from the department of physiological chemistry of Yale University. Various experiments with rats have been carried on, including the use of a purified liver extract in rats rendered anemic by a milk diet.

In the department of bacteriology intensive bacteriological studies especially of the intestinal flora of patients have been carried on. The immunological reactions of schizophrenic patients are being investigated. The study of the malarial organism in the treatment of general paralysis was completed, by which it was shown that the organism gradually and completely loses its sexual form after prolonged passage through the human body without the intervention of the mosquito. Efforts to cultivate the malarial protozoa on artificial media have been continued.

In the department of neuropathology a special investigation is being made of the brains of four selected cases of dementia præcox, the work including the study by 10 different techniques of 25 brain areas, in addition to serial sections of the diencephalon. The experimental toxic brain changes in animals have been studied after injection into these animals for long and short periods of several toxic substances normally found in the gastrointestinal tract. The changes in the nervous system in animals following experimentally produced intestinal obstruction have been investigated; these two studies are a part of the toxic approach to mental disorders. Animal experimentation with bulbocapnine has shown that the reported effects of this drug may be obtained even

after the brain cortex has been removed and it is believed that this work refutes the claims of other workers that bulbocapnine intoxication and catatonia are identical.

In cooperation with the department of psychology of the university, the carefully observed training of a series of monkeys is being carried out, preliminary to the experimental removal of various brain areas, this removal to be followed by careful observation of the effects on skilled movements and the emotions. Through the cooperation of the Morrisania Hospital brain material from patients dying of various medical conditions is being made available for comparative study with the brains of mental patients dying of similar physical disorders. Brains of children dying of complications in measles, scarlet fever and pertussis are being investigated with the thought of possibly throwing light on the understanding of the pathology of the nervous system in the various infections of childhood and their possible relation to mental deficiency and behavior disorders.

In collaboration with Dr. J. E. Scarff of the Post-Graduate Hospital, the department is interested in investigating the function of the ganglion habenula, which, though belonging to the olfactory system, is supposed to control the respiratory mechanisms. Dr. Scarff has removed the ganglion habenula in various animals, but has been unable to find as yet any definite changes in the respiratory mechanism or rhythm.

Additional collateral problems being studied are those connected with brain tumor, ophthalmo-neuromyelitis, the syndrome of medullary compression in cerebro-spinal meningitis, tuberous sclerosis, the reaction of the pontine nuclei and of the olive to the removal of the various parts of the cerebellum, the brain circulatory capacity in dementia præcox cases as compared with other pathological conditions, complete sympathectomy in animals to be tested with convulsive agents, and a review of the literature on the physiology and pathology of the diencephalon centers of the vegetative nervous system and of the literature on the organic aspects of dementia præcox.

As most of the members of the conference may know, there was recently completed a university graduate course in neurology and psychiatry of 10 weeks' duration. The members of the Institute

had an active part in this course and the clinical work was carried out on the wards of the Institute. Nineteen physicians from the State hospitals and schools took the complete course in psychiatry, with six physicians not connected with the department. We feel that this course was helpful to the participants.

Throughout the school year the Institute staff is also actively engaged with undergraduate medical school teaching. The third year students of the College of Physicians and Surgeons receive their clinical clerkships in psychiatry here. On four mornings each week there is given an hour's lecture of clinical demonstrations by members of the department of psychiatry, frequently an Institute staff member, and the following two hours are occupied by the students with examination of patients on the wards or clinic or by clinical instruction. This instruction and supervision of the students is carried out by the Institute staff members and occupies a material amount of time. The students thereby derive the advantage of actual contact with patients and become conversant by actual practice with methods of examination, symptomatology and treatment and are thus better prepared to understand and treat psychiatric problems which they will meet in practice than were students in previous eras. The didactic lectures in the third and fourth years of medicine are also given in part by the Institute staff.

We have not attempted to describe in detail all of the activities of the Institute but we have attempted to outline some of our interests. Definite reports of accomplishment must come later. We do not expect to perform miracles or to solve at once many of the problems of psychiatry. We do hope however, by rather painstaking effort to bring about an understanding of some of the questions that today arise in the community and hospitals and to give others the benefit of our experience. We feel, however, that the hospitals and schools in the Department, with their competent physicians, organization, wealth of controlled clinical material and well-functioning laboratories, are well qualified to carry out special investigations of concrete problems and that research need not by any means be confined to the Institute. We feel that constantly clinical studies particularly are being made in the hospitals and schools, which if recognized as research problems, and organized and followed up as such, would contribute materially to our fund of knowl-

edge of clinical psychiatry and be of a value which may not always be realized.

If at any time we can be of assistance to the other hospitals of the Department in their plans or problems we shall be, I think it is unnecessary to say, ready to give all the assistance in our power, just as, I am sure, the hospitals feel that they may wish to assist us as far as lies in their power.

# THE ORGANIZATION OF CLINICAL WORK IN AN INSTITUTION FOR MENTAL DEFECTIVES

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Institutions for mental defectives, like other human care agencies, are built around the requirements of their clientele. The needs of the patients should determine the construction, the equipment, the personnel and the administrative policies. Each separate activity is related directly or indirectly to the needs of the patients. The needs of the patients comprise the foundation stones upon which is erected the entire super-structure of any institution. The needs of the patients are open to determination through certain well-established modes of inquiry, examination and investigation and are to be met by a variety of care, treatment and training procedures. Organized clinical work is not only an index to good administration, but is essential to good administration. Without it, even purely administrative activities may, in some details, be ill-advised.

## The Equipment Needed for Clinical Work

A specially planned building, or at least a remodeled part of a building should be specially equipped as a center where clinical examinations may be facilitated. In the same building or in the immediate proximity, should be provided special ward accommodations, where a few patients may be temporarily housed while undergoing carefully controlled observation and examination. This, incidentally, is not to be interpreted as a reception service in the usual sense of the term. A reception building is hardly practical in an institution for mental defectives as it is highly important to introduce the new patient immediately into the several activities of the institution, even though the initial program may have to be modified after the needs have been determined through the various investigative activities.

The clinical center should be equipped with facilities for a complete survey of the physical make-up, including in addition to the usual instruments of precision, a set of anthropometric instruments, ophthalmoscopic equipment, vision test cards and a set of

test lenses, photographic appliances, a well equipped dental room, a minor surgical room and a laboratory equipped for routine clinical laboratory tests and neuro-pathological work. A mortuary providing autopsy facilities may be located in any convenient part of the institution. One, two or three rooms, according to the size of the institution, so situated that persons within are protected from distractions, should be well equipped for thorough psychometric examinations and achievement tests.

To this center, which should be provided with ample waiting room space, may be sent practically all ambulant patients from various parts of the institution for examination and investigation. It is relatively simple to organize an extension service from this clinical center for bed patients in other parts of the institution and even these, if provision has been made for special ward accommodations, may be brought to the clinical center for a temporary period, if necessary. It may be mentioned in passing that the clinical center and the hospital wards, inasmuch as they both require a great deal of the same equipment, may well be housed in the same building or in adjoining buildings connected by a closed corridor.

For each ward or dormitory service in the institution, it is essential to provide an office for the physician in charge, equipped for ordinary mental and physical examinations and provided with filing cabinets in which may be filed the case records of all patients on the service. The decentralization of physicians' offices and case records will keep the physicians on their respective services where they belong and will make immediately available for them the clinical data relating to the respective patients under their charge.

A medical library containing reference books, pamphlets and reprints on the subject of mental deficiency, psychiatry of children and related subjects, together with standard texts on general medicine is an important part of the clinical equipment. The library should subscribe for the several periodicals which are likely to be of value to the physicians, psychologists, social workers and teachers. Incidentally, it should be stated that the medical library should be furnished in a manner which will be conducive to its use by the staff.

## Scope and Technic of Clinical Investigation and Examination

1. The Anamnesis.

In all medical practice, a complete history is essential. The anamnesis should contain information about the individual patient as to parentage, infancy, development, school progress, personality, behavior and environment.

2. The Physical Examination.

The physical examination should determine the general constitutional make-up, as well as ascertain the presence or absence of disease processes or evidence of former disease conditions. Because of the general nature of mental defects, a careful neurological and endocrinological examination is of special importance. A few standard anthropometric observations with established norms, will often furnish an indication of the constitutional physique. Included in the physical examination should be a careful dental inspection by a dentist.

3. Laboratory Examination.

A blood Wassermann should be made as a routine. Wassermann reports other than those which are completely negative with both alcoholic and cholesterinized antigens should be carefully checked by repeated examination because it is characteristic of congenital syphilis to show a weekly positive or doubtful blood Wassermann reaction. A complete spinal fluid examination is indicated whenever the blood Wassermann reaction is even doubtfully positive, whenever there are indications of parental syphilis or whenever positive neurological signs are found.

A routine urinalysis on admission is easily arranged for and may disclose an otherwise unsuspected nephritis or diabetic condition; it need not be repeated unless clinical indications arise.

Blood chemistry examination should be made, according to clinical indications.

A basal metabolic determination should always be done when there are any signs suspicious of thyroid dysfunction.

X-ray examinations of the skull and chest should be made whenever there are clinical indications and an encephalogram is of special value in cases in which a brain tumor is suspected or in which brain atrophy, either genetically or pathologically determined, is probable.

4. Mental Examination.

A complete mental examination in any institution for mental defectives in this or other states is a rarity indeed. The explanation is three-fold: First, the mental test procedures have offered such an alluring short-cut by their relative simplicity and reasonable accuracy, that a wider survey of the psyche has not been considered. Second, many of the physicians in the State schools have not been trained in making thorough mental examinations. Third, it is a pre-conceived idea, and probably correct, that no outstanding mood deviation, effective disorder, or trend reaction is to be found in mental defectives; hence the attitude "why look for them?" Let us, however, analyze the situation a bit further: It is now generally conceded that the mental-age level of the moron and borderline group particularly, does not explain behavior except insofar as it lends a general coloring to the situation. We know from experience in intellectually normal children that the explanation of behavior difficulties is often found in the personality reactions and mental attitude of the child, conditioned by certain experiences and influences met in the environment. An understanding of the environment alone, however, does not offer the complete explanation. We should know how the environment has modified the emotional life and mental attitudes of the child and the nature of the original constitutional endowment; only then will we be enabled to fully understand the behavior and deal with it on a rational basis. We know also from our experience with intellectually normal children that the great majority of them do not present any outstanding mood deviations, affective disturbances or trend reactions, yet we do not stop in our mental examination of such children with one or more intelligence tests. We can and do make a reasonably complete and exhaustive mental examination.

Just because a child happens to have an I. Q. several points below the average normal child is no reason to believe that he does not have emotions, feelings, tendencies to response and attitudes. It is just these factors which make him behave as he does; it is not his mental-age level alone. And it is just these factors which have operated to bring him into the institution. Hence these factors must be considered and treated as well as his mental age if we expect to reinstate him in the community with any degree of success.

Just by way of anticipation of difficulties the physician is certain to meet in his endeavors to find out what is going on in the mind of a child, I would like to call attention to the fact that a child or adolescent, mentally deficient or intellectually normal, can successfully block all efforts on the part of the physician to uncover fundamental psychological drives and motives. The physician must appreciate that he will never get a view into the inner mind of the child until he has won its confidence. The less formalized the physician in his attitude toward the child, the more opportunities the physician takes not only to observe the child but even to join him, even if only for a few moments, in his work and play, the more sure will he be of gaining the confidence of the child.

5. The Psychometric Examination.

A routine psychometric examination should attempt to determine in all cases the level of general intelligence. It is advisable in many instances, and particularly in studying mental defectives capable of living in the community or attending school, to supplement the general intelligence tests by other special tests to uncover special abilities and disabilities. Any qualitative analysis of intelligence should be based on observations gained from several tests. Such a qualitative analysis may often indicate appropriate methods of teaching or training the individual.

The psychometric examination should always be evaluated in the light of conditions which may influence the results. The test should be carefully checked in children, who, for one reason or another, deviate markedly from the usual.

The mental-age level rating alone is relatively useless. One must know the factors which entered into the final score. Defectives who lack ability to deal with abstractions often fail on verbal intelligence tests and are lacking in scholastic ability, yet, on the other hand, they may have the ability to score high in performance and non-verbal tests, and are clever in handling concrete situations. Hence, all persons having a given mental age and intelligence quotient on a single type of test are by no means of equal intelligence.

6. Achievement Tests.

It is important, especially in children of school age, mentally and chronologically, to determine with some degree of accuracy just

what they have succeeded in learning in different school subjects. For this purpose a set of examination questions classified according to the different school grades and based on the New York State syllabus, is useful. As an alternative, the Stanford achievement test may well be used for this purpose. With the findings of the educational achievement tests and the intelligence tests, school placement may be made with some degree of certainty.

7. Progress Notes.

A continued record of observations made on the patient, a record of the patient's activities, training, recreation and reactions, and behavior during institutional residence, is of importance. It is only by a continuous follow-up that we can secure a record of the facts which are often so necessary in formulating opinions or making decisions concerning various matters pertaining to the individual patient. Anything of importance that happens in connection with the patient, any change in his health, behavior or attitude, the training he is receiving and how he responds to it and changes in the plan of training originally mapped out, are all important to record. The school progress and industrial records should be embodied in the progress notes. Well kept progress notes often are of value in administrative problems which arise in connection with individual patients.

The frequency of progress notes must be determined by the features of the individual cases. Certainly, a careful note should be made shortly after admission in all cases. In a large majority of the cases, a progress note, if conscientiously written, is sufficient if made twice a year, and in some instances, once a year, because what changes do occur, if any, occur only slowly and almost imperceptibly. In cases, however, showing outstanding behavior problems or personality changes, progress notes should be made with sufficient frequency to give a clear picture of the developments in the case. It is highly important to record at the time of happening any outstanding event or change, giving full details of the situation.

Detailed instructions regarding the anamnesis, physical examination and mental examination will be found in the monograph on the "Psychiatric Study of Problem Children," published by the Department of Mental Hygiene.

## The Facilities for Treatment and Training

1. The School.

A school organization is the most important facility of institutions for mental defectives. In a certain sense, it is a part of the clinical organization as it is an important means in meeting certain mental needs of the patients and must be under constant medical direction. The organization of the school must be a flexible one in order to meet the needs of a wide variety of cases. Special classes for patients requiring special types of instruction and for patients presenting personality difficulties should be considered. It is the school which can offer to the child the first opportunity to realize the thrill and satisfaction which comes from successful achievement. Well-organized gymnasium classes and a music teacher, who does not aspire too highly to the classical, are invaluable in that such activities furnish desirable opportunities for emotional outlet and expression. Well-organized industrial training of a varied sort to meet the needs of varying mental levels and both sexes is essential.

2. Acute Hospital Service.

In order to properly care for the acutely physically ill, it is important to make provisions for an acute medical and surgical service, with all its special appointments, including surgical and X-ray equipment.

3. Chronic Hospital Service.

In every institution for mental defectives, there are many who are chronically ill and physically infirm. They are usually exceedingly helpless and a large number of them are of very low grade mentally, and spend the greater part of their time in bed. They require essentially hospital nursing care.

4. Service for the Physically Handicapped.

Distinction should be made between the infirm and the physically handicapped. The infirm includes those cases who are almost entirely helpless, mentally and physically. The physically handicapped, however, are of a much better level mentally and are able to get about in wheel chairs, on crutches, and with the aid of other mechanical devices. The physically handicapped group are in need

only of attendant type of assistance and should have the advantage of specially organized occupational training and busy work.

5. Psychopathic Service.

In every institution for mental defectives, there is a small number of high grade cases who display psychopathic personalities. In fact there is sufficient evidence to suggest that emotional conflicts or personality problems may either act to emphasize only a slight defect of intelligence or sometimes even to so handicap the child that it appears to be much more defective than it actually is.

The psychopathic ward should not be regarded in any way as a disciplinary or lock-up ward. Neither should its function be to care for the definitely psychotic. In fact, its purpose would be defeated by such an attitude. It should be equipped with occupational therapy supplies and apparatus and provisions for sedative hydrotherapy.

6. Parole or Colony Service.

For each institution, there should be organized a small service for, what might be termed, pre-parole patients. In this service, patients would be placed more on their own responsibility and an opportunity would thus be given for the observation of their reactions to less rigid supervision. From this service, patients may then be sent out into the community, into colonies or on parole to selected homes, and when situations warrant, to their own homes. Continued observation is important, however, and an alert social service worker may be capable of anticipating problems prior to their culmination, in individual patients.

## The Personnel

Neither time nor space permits a complete discussion of the personnel indicated in the foregoing pages. This would make a sizeable communication in itself. In briefly sketching the staff required for clinical work certain linkages or interdependencies of the work of the entire institution must be kept in view. To begin with, medical direction is important all the way through, whether administrative or clinical activities are involved. In order to facilitate the proper management of the institution and the training of patients, classification of the patients into different services is essential. The

major part of the administrative responsibilities of a physician in charge of a service is concerned with the care, training, and treatment of the patients. The physician must work through the ward and other personnel in order to accomplish what is intended. Therefore, he must know thoroughly the employees who are in daily contact with his patients. "The social education of patients is of first importance"—so wrote Dr. Wallace, one of the greatest leaders in the field. Social education is a twenty-four-hour-a-day proposition, and no matter how fine a group of physicians, teachers or others an institution may have, their efforts may be entirely set aside by a few incompetent, undesirable, unsympathetic attendants with whom the children spend the greater part of their day. Above all, the majority of institution employees must have, as pointed out by Dr. Wallace, "a sympathetic understanding of children." The physician must be aware of the clinical needs of his patients if he is to know what to expect from and how to advise his employees. the physician can meet more adequately the administrative problems arising on his service if he is cognizant of the nature of the clinical problems presented by his patients.

In carrying out the treatment and training of patients, much of which is intimately tied up in administrative problems and executive details, it is of vital importance to be in possession of the findings brought out by the clinical examination.

In order to facilitate an adequate clinical study of the patients the various staff physicians should be trained to take satisfactory histories and to make good mental and physical examinations under the immediate supervision of the clinical director. This group of physicians, together with the members of the psychological and social service departments, would act as a unit for the complete clinical study of all new admissions and others referred for one or another reason from the various ward services to the clinical center. A complete record of the findings of this well trained group should be available to the various physicians in charge of the ward services. Therefore it is necessary that a complete case record, either in original or duplicate of all patients in each ward service, be accessibly filed in the physician's office. In order to insure the perusal and study of these case records, the physicians in charge of the services should be expected to summarize the case record of

each patient at stated intervals after admission and such physicians should also carry the responsibility for recording the regular progress notes. As a part of the initial clinical examination, specific recommendations for training and treatment should be made to the physicians in charge of the ward services.

Staff meetings attended by the medical staff, psychologists, social workers, and the head teachers, should be held at least once a week, and preferably twice a week. These meetings should be clinical in nature and should be given over to the presentation of patients and discussion of case histories. The clinical director, after conferring with the physicians in charge of the various ward services, should select such cases in which there is involved a definite problem either as to diagnosis or treatment. Rare and unsual cases may be spectacular or dramatic and should be presented from time to time, but under no circumstances, should they replace the type of case that represents the common-place, every-day perplexing problems of diagnosis, care, treatment or training. Repeated presentation of the latter type of case offers an opportunity for exchange of views which eventually may lead to constructive modifications in treatment and more skillful diagnostic interpretation.

## Conclusion

In conclusion, it should be indicated that we yet have a great deal to learn about mental defectives—the nature of their condition, the the causes of it and even the practicable, useful and profitable methods of dealing with them individually and collectively. Modifications in our present-day methods will come about only to the extent that we bear in mind in our every-day activities the needs of our patients; these are determined mainly through a careful and complete—more complete than is now customary—clinical study. Absorption in administrative details to the exclusion of clinical interests in physicians who are charged with the responsibility of the patients under their care, will never lead to constructive advances. Fernald and Wallace, the two foremost leaders in the field, were remarkable executives, yet, both were actively interested in the clinical aspects of the problem even up to the time of their deaths. A contributing factor to their phenomenal executive wisdom was their alertness to the clinical problems and needs of their patients.

It is exceedingly doubtful if important contributions to the education and treatment of mental defectives will ever be made by research workers within the four walls of a laboratory, far removed and isolated from the practical, vital, human, every-day life of the institution. Unless the clinical spirit, the spirit of investigation, the spirit of accurate observation of human behavior invades and permeates the entire professional staff of our institutions for mental defectives, we shall simply continue to mark time with one of the most vital problems of society, the mental defective.

# COORDINATED AND STANDARDIZED DENTISTRY FOR STATE HOSPITALS

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Because dentistry has become an exceedingly important specialty of medicine in our State hospitals, it would be advisable for the State Department of Mental Hygiene to formulate definite plans at this time, to insure the continued progress and development of this branch of the healing art, along efficient and scientific lines.

By organizing and coordinating all our dental offices, and then standardizing and periodically supervising the procedure in them, these two beneficial results will immediately follow:

1. Our patients will receive a higher and more uniform type of service resulting in improved oral health.

2. Our dentists by having available the experience and methods of fellow practitioners in State service will be enabled to render a more efficient and scientific type of service.

The State Department of Mental Hygiene by having available a list of standard approved dental office equipment and supplies, can reduce to a considerable degree the cost of equipping new dental offices and of maintaining the older ones. Such list would eliminate a great deal of waste and inefficiency that invariably results when inexperienced men equip new offices. The list would further eliminate individual experimentation by each hospital dentist with new appliances and new supplies.

In 1918, 4 dental internes comprised the entire dental personnel of our State service. At the present time we have 7 senior dentists, 12 dentists and 11 dental internes. This makes a total of 30. The number of dentists will be increased when the new hospitals now under construction are opened, and the older ones expand.

It might be interesting to outline the development of dentistry at the Manhattan State Hospital, for such development parallels to a certain extent the dental progress in our other State hospitals. The first dental interne was appointed to the staff of the Manhattan State Hospital in 1917. Prior to that time, the hospital was visited once a week by a dentist. He utilized one instrument for

the alleviation of all dental pathology. That instrument was a pair of extracting forceps. During the absence of the dentist, if a patient had pain in a tooth, he was referred to a staff physician who did the emergency extracting. The writer was appointed resident dentist in 1918. The dental office, as many of you remember, was situated in the rear of the Keener building, adjoining the kitchen. The equipment was old and antiquated and consisted of a barber's chair, a cuspidor with no running water, and a foot engine. With this equipment and suitable instruments it was possible for the first time to fill and replace teeth as well as to extract them. In 1920 a complete new outfit was added, and an additional dental interne appointed. In 1922 the dentist office was moved and became part of the diagnostic clinic. The dental office now has three complete, modern dental units, and employes three resident dentists, a dental nurse, a dental attendant and a dental filing clerk. In 1923 a dental chart was designed by the writer for recording the dental findings and treatments. This chart has since been adopted in all State hospitals, and now forms part of the patient's case history. Aside from the adoption of the dental chart no attempt has been made by the Department of Mental Hygiene to coordinate, standardize or supervise dental procedure.

It is interesting to note that while the State requires the medical staff to hold regular staff meetings, attend conferences, contribute to medical literature and attend especially prepared courses of instruction at the Psychiatric Institute, there has been no provision made for dental meetings or periodic dental conferences. The dentists are not encouraged to undertake any research work, or to contribute to dental literature, nor are post-graduate courses provided for them. Due to the indifference therefore, on the part of the medical staff, the dentists in our institutions have formulated their own policies regarding the operation of their offices. Some men are ultra conservative. They retain teeth that have extensive caries, even extirpating the pulp of these teeth, and doing root canal work. Other men extract all the teeth that have compound cavities. Some of our men treat and conserve pyorrhetic teeth. Other men regard these teeth as potential sources of infection and extract them. This condition exists because the State Department

of Mental Hygiene has not formulated any definite policy or procedure for the dental treatment of patients.

The superintendent of a State hospital or school at the present time has no definite way of knowing whether the service the hospital dentist renders is the most modern and scientific. He cannot tell whether the technique employed is the accepted one for the operation, and consistent with present-day thought on the subject. The superintendent has no direct way of knowing whether his dentist attends dental conferences, meetings, clinics or contributes to dental literature. As conditions are today each dentist requisitions his supplies directly through the steward. There is no way of telling therefore, whether the equipment and supplies he orders are the most modern and scientific, and whether they are absolutely necessary. Dental equipment and supplies are no small items in a hospital budget. The cost of equipping a modern office with two complete outfits, including a laboratory, is over $6,000. The cost of supplies for such an office is approximately $600 a year.

In the absence of any definite information on this subject each dentist experiments individually with equipment, X-ray films, filling materials and instruments. A great deal of inefficiency can therefore be eliminated by the establishment of a State list of standard, approved dental supplies and equipment. The State can then purchase large quantities of these standard supplies in advance, and furnish each dental office in accordance with its needs, or the dentist can requisition for the approved supplies directly through his steward. This would not only eliminate a great deal of waste and inefficiency, but the State could save vast sums of money by purchasing large quantities of standard supplies directly from the manufacturers.

As conditions are today an inefficient dentist can stay at one of our hospitals indefinitely providing he does not get into some difficulty either with a patient or some visitor, thereby bringing the matter of his inefficiency to the attention of the superintendent. The superintendent of a hospital with his many duties and responsibilities cannot be expected to familiarize himself with dental routine or with dental problems. These problems can well be relegated for solution and advice to the dental supervisor or dental consultant.

The dental departments in our hospitals should be intimately linked with one another and with their medical staffs. This arrangement would permit of the close relationship and cooperation which should exist in any well-organized and integrated medical group. This interrelationship fosters cooperation between the specialties in the hospital and the dental offices in other State institutions that are now functining as individual units. This coordination would enable us to obtain one of the ideals in the medical field, namely, an amalgamation of medical units that serves to regard the sick person as a total biological organism, rather than as an individual artificially separated into parts such as teeth, lungs, heart, nervous system, gastro-intestinal tract, etc.

To quote from an address by Alfred Owre, D. M. D., M. D., dean of Columbia University Dental School, and one of our foremost educators in an address before the Central Dental Association of Northern New Jersey on the "Relationship of the Physician and the Dentist."

"One thing seems fairly certain—the old system of dental and medical education and practice are bound to see radical changes in the next decade or so. Economic considerations are arousing both public and practitioner to protest against waste and inefficiency. There is genuine interest in revamping both education and practice with an eye to economy in educational outlay, as well as in expenditure for adquate and scientific health care. The blissful ignorance of the systemic effects of oral practice largely enjoyed by doctors and dentists prior to 1910 is no longer tolerated."

The dental problems in our State hospitals differs from the dental problems existing on normal patients in these three respects.

1. In the treatment of psychotic patients, the elimination of foci infection is of great importance. Nevertheless no dental tissue should be removed from the mouth of a psychotic patient if more conservative measures can restore them to normal function. It is essential therefore, that our dentists be progressively conservative.

We find that too many teeth have been needlessly sacrificed on the alter of focal infection. When we bear in mind the fact that only a small percentage of the extracted teeth are replaced in the mouths of our patients, due either to economic reasons, or to the fact that our patients are suffering from a mental disorder, and

therefore cannot or will not wear artificial appliances, you will agree that progressive conservation is essential. You may not all be familiar with the periodontal pathology that invariably results when missing teeth are not replaced so I have prepared two slides that I will show you. The first picture, Fig. 1, shows a normal mouth following the extraction of two teeth on either side. The second picture, Fig. 2, shows the mouth with no attempt to replace the missing teeth. Note the amount of drifting that has occurred; note the rotation of the teeth, and the inflammation of the gums; note the lack of balance and the marked disturbance of function that has resulted. Not only is it impossible to masticate one's food thoroughly with teeth in this condition, but, due to the lack of occlusal relationship, the upper and lower teeth continue to drift and either loosen or become more susceptible to erosion and decay. Hence the importance of conserving the patients' teeth.

2. Another problem that should receive our serious consideration is the connection of dental and facial deformities to the psychosis. The accompanying pictures, (Figs. 3 and 4 and 5 and 6) show physical deformities that played a potent role in the pathogenesis of the mental syndrome. The dental surgeon along with other medical specialists can thus contribute his experience and knowledge in the important field of mental prophylaxis and therapy. Credit is due Dr. Devine for the result in this case.

3. Another problem that must be considered is the importance of pain elimination in the dental treatment of our patients. The fear of pain in a dental chair is universal, therefore its elimiation in the treatment of mental patients is of unusual significance. When we consider that most of our patients are extremely emotional and very sensitive to real and imagined pains, we realize how important it is to make the patient feel at ease, and to refrain from doing or saying anything that will tend to make the patient fearful or apprehensive. By having the patient comfortable and cooperative the operator is able to render more efficient and thorough service, and consequently be under little or no nervous tension himself. The conservation of the energy of the operator is of great importance as it enables him to be cheerful in his attitude to the next patient and more efficient in his work.

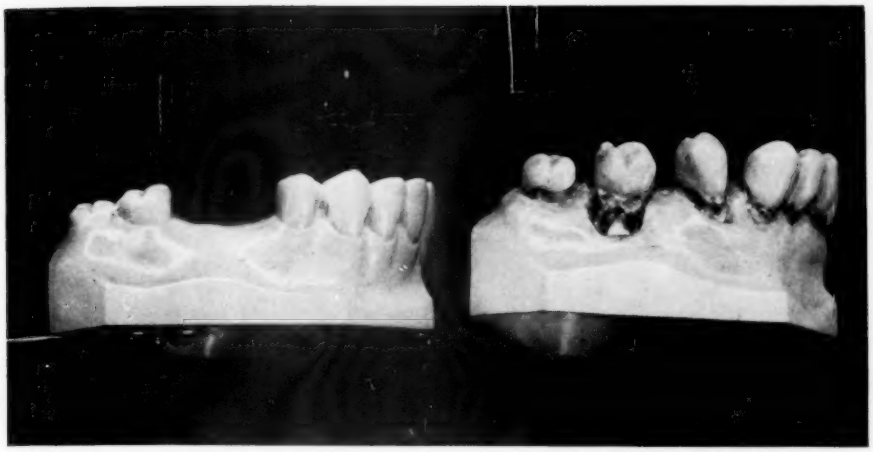

Figure 1

(a) Side and full view of mouth following the extraction of two teeth

(b) Side and full view of mouth with no replacement work, six years later

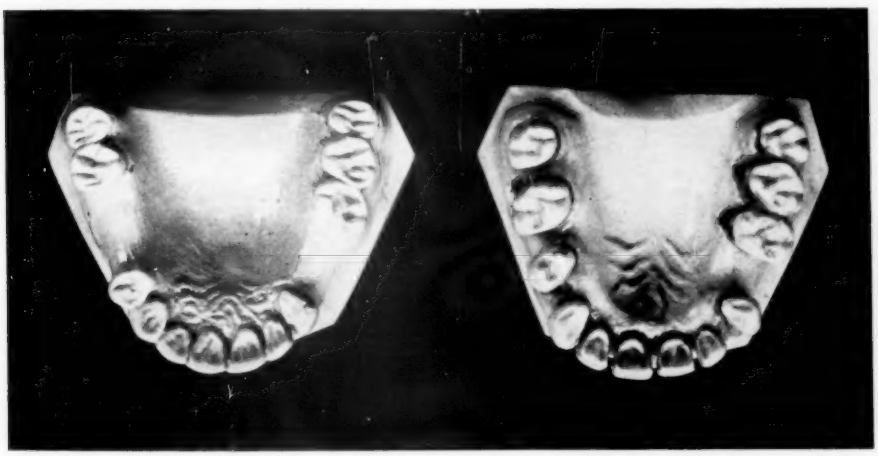

Figure 2

(a) Side and full view of mouth following the extraction of two teeth

(b) Side and full view of mouth with no replacement work, six years later

Figure 3. Lateral view showing open bite

Figure 4. Full face showing open bite

Figure 5. Lateral view with appliance in position

Figure 6. Full face with appliance in position

Pain and surgical shock should be eliminated in the treatment of our patients by a combination of the following means A. Medicinal. B. Physical. C. Psychological.

A. By medicinal we mean the employment of nitrous oxide oxygen and novocaine. The former as a general anesthetic and analgesic, and the latter as a local anesthetic. All our dentists should be taught the technique of administering these anesthetics efficiently.

B. Physical. A great deal of pain can be eliminated by the use of the device portrayed in Fig. 7. This lubricator will enable the operator to eliminate a great deal of friction and heat, that is generated when a cavity is prepared or a tooth ground down. With this appliance a stream of warm water is sprayed automatically on the burr and into the cavity. As soon as the engine stops the water ceases to flow. This lubricator should be included as standard dental office equipment.

C. Psychological. As pain is essentially a subjective expression or sensation, we can by psychological means affect the patient so that they perceive pain less intensely. Our problem is to convince the patient that pain will be minimized, and so influence his behavior in that respect. All our methods therefore, must essentially be that of suggestion thereby forcing into the patient's consciousness the thought that pain will be a negligible factor in the proceedings. We utilize various psychological methods to secure this result. A very important psychological effort can be secured by the arrangement of the equipment in the office and by the appearance and conduct of the operators and nurses therein.

The dental office should be equipped and arranged to create a quiet cheerful atmosphere. Fig. 8 is a picture of the dental office designed by the writer for the Psychiatric Institute and Hospital. The outfits are finished in nile green while the walls are a light cream color. The contrast is very pleasing and makes the room more inviting and less like the regular appearance of a hospital. It has been our observation that an all white outfit invariably gives a depressing psychic effect. All fear inspiring instruments are concealed and the entire effect is one of orderliness and quiet efficiency. The writer has had a special

switch attached to the dental unit. This switch shuts off the current that supplies the engine and the lights. Before preparing a cavity and during the cavity preparation the patient is permitted to hold this switch. If the patient experiences any pain, he or she is advised to press the button on the switch, thereby disconnecting the engine and the light. The effect is very dramatic. The first impression one would have is that the patient would continually shut off the current. Our practical experience with this device is entirely different however, we note that the patients feel more assured and permit more work to be done. Most patients have a morbid dread of being unable to advise the operator of the pain they are experiencing, due to their inability to talk while the engine is revolving. With this device the patient is in control of the situation, and is more confident that pain will be a negligible factor in the proceedings. The writer received this idea from Dr. E. Best.

In view of these factors it would be suggested that the Department of Mental Hygiene institute certain changes in the operation of its dental offices with the following plan as a basis.

1. *Organization and Coordination of Dental Offices.* By this we mean the employment of a uniform charting system for recording the dental findings, the dental requirements and the results of the dental operations. A specially prepared and revised dental chart is to be used for this purpose. The advantage of employing a uniform charting system can readily be appreciated when we realize that a number of our patients are being transferred continually from one of our hospitals to another. Another factor that must be considered in this connection is that there are two or more dentists in each hospital, and a uniform charting system will enable each of them to see at a glance just what the previous operator did. This new chart will also make it easier for the physician to interpret the dental findings and to follow the treatments. If a patient is transferred from one hospital to another, it will enable the new dentist to see what dental procedure was previously performed.

2. *Dental Supervision.* By this we mean the regular contact of a consultant or chief supervising dentist with the State hospital dentists, who are performing the actual work of the hospital. The consultant or supervisor assumes responsibility for the quality of the work turned out, and is available for consultation. This cooper-

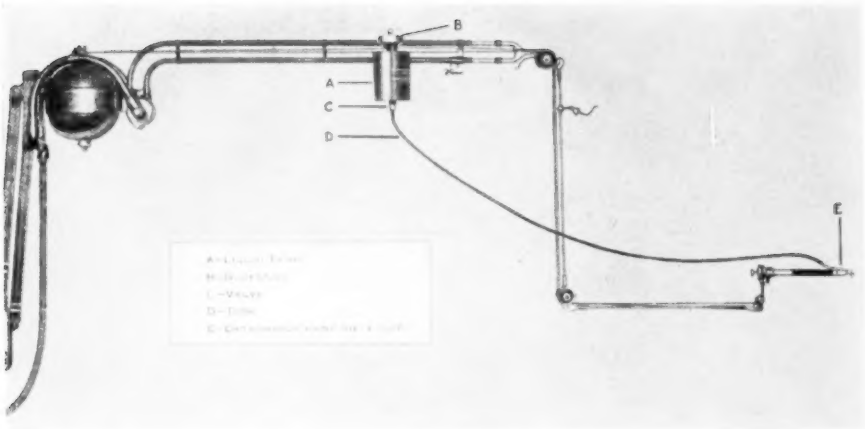


Figure 7. Cooling device for grinding teeth

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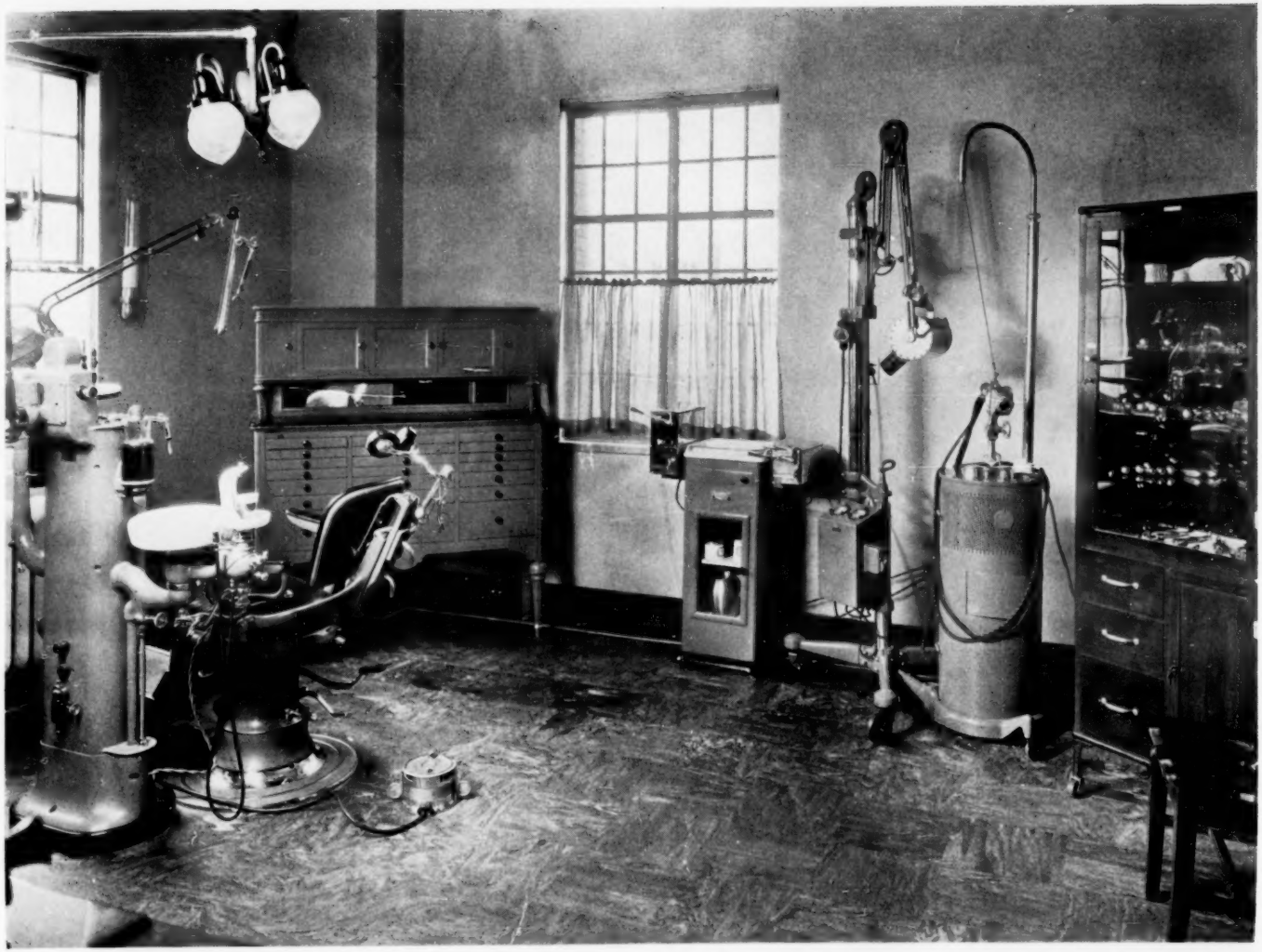

Figure 8. Dental office at Psychiatric Institute

ation gives the men in the hospital a constructive interest in their work, and develops a progressive and stimulating morale. The purpose in other words of the consultant or supervisor is therefore not to tell the dentists in the institution how to practice dentistry, but to cooperate with them so that a high uniform type of service results. In this connection it would be advisable for a dental supervisor, inspector or director to be appointed to function in the same manner as the medical inspector, director of occupational therapy or the director of social service.

3. *Standardized Dental Procedure.* By this we mean the formulation of a definite mode of procedure for the dental treatment of our patients following admission. Briefly outlined this would consist of the following:

A. Notations on the new revised chart of complete mouth examination.

B. Complete X-ray series of mouth.

C. Rendering of emergency treatment.

D. Arrangements for operative, preventive and restorative treatment.

It would be advisable in this connection for the State to publish a specially prepared handbook for daily reference, to be furnished to each dentist. The approved procedure for every dental operation to be included therein. This dental procedure should be formulated by a committee of dentists from our State offices.

4. *Uniform Ordering of Supplies.* The consultant or supervisor should check the list of all quarterly supplies that are ordered. This will have tendency to eliminate non-essentials, and to restrain each dentist from experimenting individually with untried filling materials and new expensive appliances.

5. *Post-Graduate Instruction.* Once a year each hospital should send a dentist to the Psychiatric Institute where post-graduate instruction can be given, both at the Institute's dental office which has been specially arranged and equipped with every conceivable appliance for teaching purposes, and at the Columbia University School of Dentistry. In addition to advanced dental instruction, our dentists could receive courses of instruction in bacteriology, psychology, etc., at the Psychiatric Institute. Dean Owre of the Columbia

Figure 8. Dental office at Psychiatric Institute

University Dental College has assured the writer of his cooperation in arranging post-graduate instruction for our dentists.

6. *Dental Conference.* Once a year the senior dentist, the dentist and the dental interne of all the State hospitals should meet in conference and papers of common interest on dental subjects should be presented and discussed. At this time, clinics could be presented by the different men. This would undoubtedly prove very valuable in stimulating the morale of our dentists, and in raising the dental standards in our hospitals.

7. *Periodic Denial Inspection of Offices.* The dental supervisor or inspector should check up the records of completed work on patients and to note the office management. If he finds that the senior dentist in a large active hospital is unable to cope efficiently with the dental problems there, he can arrange with the respective superintendents for this dentist to be transferred to a less active institution and a more progressive man can be placed in his stead.

8. *Dental Internes.* The dental inspector or supervisor should examine and check the qualifications of all applicants for positions in all our State hospital dental offices. He should have a list of all the dental vacancies and should make recommendations to the superintendent from the applicants on hand. A dental interne should be appointed for a period not to exceed one year, and should then be qualified to take an examination for promotion.

9. *Dental promotion.* Dental promotion examinations should be held at frequent intervals for the position of dentist and senior dentist.

10. *The Employment of a Dental Hygienist in Every Hospital.* A dental hygienist as you know is a young woman who has been specially trained in oral prophylaxis, and is licensed and permitted by the State to clean teeth and scrape the tartar up to the gum margin. This woman would relieve the dentist of one form of office routine enabling him to concentrate on the more complicated work.

11. *Meetings of Dental Nurses, Hygienists and Office Assistants.* Various labor-saving devices could be discussed by them together with other subjects of common interest on efficient office routine.

12. *Dental Examinations for Vincent's Infection of All Employees Handling Food.*

13. *Dental Work on Employees.* Emergency work should be rendered employees and members of the staff at all hours. New employees should receive dental as well as medical examination. The experiences of most of our large industrial organizations indicate that good oral health of the employees make for more efficient work.

14. *Replacement Work on Patients.* All funds to be received and paid by the steward. The dentist should furnish an estimate and all funds should be on deposit before the work is started. Patients staying for a short time at the hospital should not receive extensive replacement work. This takes up too much time and can be taken care of after the patient leaves the hospital by a private dentist or clinic.

15. *The Psychiatric Institute can prepare a series of educational stereopticon slides and moving picture films on the subject of oral hygiene and dental prophylaxis.* These slides and moving pictures can be loaned to our hospitals and schools and can be exhibited to the medical staff; the employees, particularly the nurses, and the patients. This would stimulate an interest in this important subject.

16. *The hospital dentist should continue to render dental treatments to patients while on parole from the institution.*

With the splendid dental equipment most of our hospitals have, with the excellent clinical material, with the unusual research facilities such as our existing pathological laboratories, and with a coordinated, standardized and supervised dental program, many medico-dental problems could be undertaken. The human nutritional problem in its relation to tooth and bone development could be studied from interesting angles. Bacteriological studies on focal infection, caries and pyorrhea alveolaris could be made with no additional financial outlay, yielding rich rewards both to our patients, our staffs and the citizens of this State, who are making this work possible.

Before closing I wish to express my sincere appreciation to Dr. Robert Abrahams, chairman of the Board of Visitors of the Manhattan State Hospital, and to Dr. Clarence O. Cheney, director of this Institute, for their extremely helpful cooperation in the preparation of this paper.

# THE DEMENTIA PRAECOX- SCHIZOPHRENIA PROBLEM

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Dementia præcox is responsible for approximately 23 per cent of the first admissions to the state hospitals in Massachusetts.[1] In New York the admission rate is about 26 per cent.[2] Throughout the country as a whole, as has been shown by recent reports of the United States Census Bureau,[3] it constitutes 22 per cent of all the psychoses represented in the first admissions to mental hospitals. In view of the fact that over 50 per cent of all of the patients housed in these institutions are suffering from dementia præcox, the importance of that psychosis cannot be overestimated. That death is due to tuberculosis in one-third of these cases dying in our hospitals[4] is worthy of serious consideration. The maintenance cost of caring for this large population is a financial burden which has long since assumed enormous proportions. It is estimated as amounting to over forty million dollars annually.

Under the circumstances, the necessity of accurate information regarding the various phases of this important problem must be conceded. A study of the incidence of dementia præcox as reported by authorities in various parts of the country shows conclusively that there is a wide divergence of opinion as to the nature of this disease. The views of Bleuler on this subject have added materially to the condition of uncertainty which has existed for years. Kraepelin's original description of dementia præcox as essentially a deteriorating process is diametrically opposed to the theories later advanced by Bleuler. If we are to reach any intelligent conclusions regarding the evaluation of this most important of all the psychoses, there must be some definite agreement as to what constitutes dementia præcox and how it is to be defined. Until that has been accomplished, our statistics relating to that disease must be looked upon as subject to future revisions which may be far-reaching if not actually revolutionary in character. In view of the widespread prevalence of that psychosis, the question as to the complete recoverability of dementia præcox should be definitely settled for all time.

An understanding of the general field covered by this disease

necessitates a careful consideration of the various steps which led up to the dementia præcox concept of Kraepelin. He grouped together under that designation various clinical entities previously described. All of these, according to Kraepelin, had at least one thing in common—the comparatively early appearance of an intellectual deterioration. An understanding of the psychological factors responsible for the various manifestations of dementia præcox is vitally important. His analysis of the fundamental mental mechanisms involved in the psychoses included in this group led Bleuler to his well-known description of schizophrenia in 1911. It will be generally admitted, I think, that the nomenclature of this disease at this time is a matter of comparatively little consequence. In view of the importance of many of the numerous references to dementia præcox in the literature of psychiatry, it has been deemed advisable, as far as possible, to quote directly from the original articles on the various subjects discussed. Although frequently referred to in the various textbooks on psychiatry, very few of these epoch-making contributions have ever been translated or quoted verbatim.

The words "dementia præcox" were used for the first time, as far as can be determined, by B. A. Morel[5] in 1860. His description of the disease was so interesting as to be well worthy of repetition:

"An unfortunate father consulted me one day regarding the mental condition of his son, between thirteen and fourteen years of age, and in whom a violent hatred of the author of his existence had replaced the most tender of sentiments. The child, whose head was well formed and whose intellectual faculties surpassed many of his comrades in his studies, struck me at the first glance as showing an arrest in development in stature. His first discontent related to this insignificant appearance, which was far from being the source of the peculiar abnormalities in his feelings. He was despondent about being the smallest in his class, although he was always first in his examinations, and that without effort and almost without study. It was, as it were, by intuition that he understood things and that everyhing was classified in his memory and his intellect. Unconsciously he lost his cheerfulness and became somber, taciturn, and showed a tendency to solitude. It appeared at first that he had onanistic tendencies, but that was not the case. The state of melancholy depression of the child, his hatred of his father, even with the idea of killing him, had an entirely different cause. His mother was insane and his grandmother eccentric to the last degree.

"I ordered an interruption in his studies, and his isolation in a hydro-

therapeutic institution. Gymnastic exercises, baths, manual labor, were needed in the new hygienic conditions of his existence. These means were employed systematically and intelligently under the direction of a judicious and learned physician, Dr. Gillebert d'Hercourt, and a most favorable improvement was made in the physical condition of the child. He grew considerably, but another symptom as disturbing as those described began to dominate the situation. The young invalid progressively forgot all that he had learned, and his brilliant intellectual faculties entered into a very disturbing period of arrest. A kind of inactivity bordering on stupidity replaced his former activity and when I saw him again it looked as if a transition to an irrecoverable state of dementia præcox was taking place. This unfavorable prognosis is usually far from the minds of the parents and even the physicians who are taking care of these children."

Unfortunately, Morel interpreted this disorder as an arrest of development which should be included with mental deficiency as a "variety of intellectual, physical, and moral degeneracy in the human race due to heredity."

Meyer's reference to this contribution[6] was of historical value:

"With Morel, in the fifties, we meet the term 'démence précoce' in connection with a type of 'stupidité.' With a certain sense for more fundamental nosological ambitions, it was presented not as accidental but as constitutional. But with him the preoccupations were in the direction of degeneracy in the sense of the fate of successive generations, which had to carry the burden of the occurrence and the bad prognosis of mental disease. Degeneracy became a lasting obsession, especially in French psychiatry, but by no means necessarily with the connotation of deterioration into a dementia. This conception of degeneracy beclouded the more clearly nosological ambition of Morel, that of looking for unity of cause, course, and outcome."

There are very few other early references to dementia præcox under this particular designation.

Schüle,[7] in speaking of the termination of various psychoses, in 1886, said: "There is finally a frequent tendency to a premature psychic standstill (dementia præcox) or to a progressive mental degeneration (degenerative forms with moral insanity)." In his discussion of hereditary neuroses, he also referred to dementia præcox: "Episodes of genuine insanity may develop (usually in the form of compulsive depressive ideas). Other cases remain stationary until puberty. Not a few of these hereditary cases are

stranded on this first rock; some develop into hebephrenias, others into dementia acuta (præcox)." It must be admitted, however, that this throws very little light on the subject of dementia præcox as we know it today.

In the meanwhile, various American, English, and other psychiatrists were discussing the psychoses of adolescence and puberty, juvenile insanity, primary dementia, etc. These forms clearly belong within that general grouping, but had little if any bearing on the considerations which influenced Kraepelin in his description of dementia præcox. Certainly those who wrote of these various types of primary dementia, so-called, gave no thought to the fundamental mechanisms which Bleuler pointed out as the essential features of schizophrenia

The first important landmark in the history of dementia præcox is unquestionably the contribution made by Hecker on hebephrenia in 1871, although that clinical entity had already been referred to previously by Kahlbaum. Hecker's own description of that psychosis was as follows:[8]

"Among the mental symptoms of general paresis Westphal points out, not without justice, as a special characteristic the early appearance of a mental weakness which progresses very rapidly. Mixed in with the first stages of melancholia and mania are the suggestions of a rapidly progressing deterioration. This mental decline commences almost with the beginning of the disease. Kahlbaum in his lectures called attention first to the fact that in another disease there are characteristic symptoms which have nothing in common with paralysis, the hebephrenia proposed by him, a mental disorder which also shows variable forms and appears during the years of puberty closely associated with gross changes at this time in the physical and mental development."

"Hebephrenia is a disease which always develops at the time of puberty. All of the cases mentioned, where the beginning of the disease was clearly defined, appeared between the ages of 18 and 22, at a time when the progressive "renewal and transformation of the ego" (Griesinger) during puberty under normal circumstances has practically reached its completion. This psychological process, which appears with a series of particularly marked symptoms, is manifested as a pathological permanence in hebephrenia, in that the symptoms which are observed temporarily in the period of transition present themselves in a markedly increased degree in the disease and finally lead to a peculiar end stage, which, on account of its characteristic features, we may designate as hebephrenic deterioration."

"The disease begins in the majority of cases apparently as the result of a profound emotional alteration with the various symptoms of melancholia which soon finds its expression in a vague, indefinite sadness and emotional depression and is then gradually mixed with definite but very changeable delusional ideas. Almost all phases of the emotional life may, one after another, become involved in the depressive mood, and the melancholia may express itself in contrite self-accusations, sentimental and amorous fancies, or finally in dull brooding ideas of persecution and injury. At the same time, there is soon shown a great superficiality of feeling and the picture of this melancholia is very different from the pictures of misery shown, for instance, in genuine dysthymia. It often seems as if the patients play or toy voluntarily with their melancholy feelings, and soon a more cheerful mood appears in contrast with the sadness. After an absorption in the awful tragedy, the misfortune which has befallen him, or a lamentation over the sins which he has committed, and the persecution inflicted upon him, the patient often cannot repress a tendency to laugh and make foolish jokes. Then appears an increased tendency to a peculiar activity which may develop into an outspoken expansive mania. As a rule it manifests itself in an aimless, objectless, foolish conduct, in a tendency to tramp life and wandering about, and such individuals may get along in the world for a long while without being recognized as abnormal. Often there is a danger, on account of the peculiar type of their weakmindedness, of being looked upon as malingerers, which is often done in some cases intentionally and shows itself in absurdities of speech and conduct. This form has, therefore, an important significance in forensic psychiatry. Such a case, where five opposing medical opinions were given and where the undoubted hebephrenic was first declared sane and sentenced and then was declared insane in the penitentiary as a result of repeated vigorous efforts with the cooperation of Kahlbaum, was recently published in another place."

"The characteristic features of hebephrenia above all are: its appearance in connection with puberty, the succession or changing appearance of various forms (melancholia, mania, and confusion), the very quick termination in a psychic enfeeblement, and a characteristic form of final deterioration, the evidences of which can be seen in the first stages of the disease."

The next great step in the development of the dementia præcox concept was the description of catatonia by Kahlbaum in 1874. His observations regarding the essential features of that disorder were as follows:[9]

"I shall now endeavor to describe in this work a disease picture in which definite somatic as well as muscular symptoms accompany the mental mani-

festations in even greater frequency than in paralytic insanity, and as in that disease bear an essential relation to the form of the whole disease process.

"This disease picture stands in nearest relation to the condition usually referred to as melancholia attonita, which has heretofore been looked upon as a specific disease entity, although it very rarely appears primarily and more often as a simple melancholia, or as is frequently the case, as a melancholia with a subsequent mania, the melancholia attonita representing the third stage of the disease process. If the disease does not lead to a recovery, the melancholia attonita eventually ends in a terminal dementia, so that in this same disease four different conditions, one after the other, enter into the psychic picture of the disease process. These observations agree with the opinions expressed by Guislain, Zeller and Griesinger, that mental diseases progress by various stages with changing mental characteristics and also that like simple melancholia, mania, and dementia, even melancholia attonita may be looked upon as a specific disease entity. The so-called melancholia attonita refers to that condition in which the patient sits quietly or completely mute and motionless, immovable, with a staring countenance, the eyes fixed on a distant point and apparently completely without volition, without any reaction to sensory impressions, sometimes with a full fledged cerea flexibilitas, as in catalepsy, sometimes with only a slight but definitely appreciable degree of this striking manifestation. The general condition of such a patient gives the impression of a deep mental distress or a fixedness resulting from a severe fright, and as a disease entity is assigned now to the depressive states (whence the name melancholia attonita), now to the debilitated states (stupor or dementia stupida), or is looked upon as a combination of the two (Baillarger's melancholie avec stupeur). This peculiar form of mental condition continues in the patient, when it once appears, for a considerable time, sometimes appearing repeatedly and then often in a transitory manner. As the intensity of development is not always so pronounced as in the description given, and on account of definite incomplete development, the correct conception of this condition is sometimes overlooked. Practically overlooked also is the very definite association with other disease processes and the frequent association with definite somatic and, above all, muscular symptoms.

"If we submit the cases which show during their course a melancholia attonita, or, more briefly stated, an attonicity, to a careful clinical study, we find epileptiform attacks appearing in the early stages of the disease in many patients, or in a large number of cases other convulsive conditions which soon terminate in permanent epileptiform states. In the stage of attonicity these find their most marked development in cerea flexibilitas and

persist in some form even in the stage of terminal dementia. In addition to these interesting somatic symptoms, the specific significance of which may be compared with the paralytic manifestation of general progressive paralysis, with or without ideas of grandeur throughout, these cases show other definite psychic as well as somatic characteristics. There is particularly a characteristic form of exaltation which may be described as a pathetic ecstasy and, further, a striking impulse to talk in the form of speeches, which, with the well-known elements of attonicity and other commoner symptoms, are characteristic.

"This disease form appears in a way as a clinical counterpart of general progressive paralysis with or without grandiose ideas. In many respects, referring to its course in various types of psychic disease pictures, and its definite association with muscular symptoms, it shows a clear analogy to that disease. In other respects—first in reference to the quality of the muscular and psychic disorders, as will be shown later with special reference to prognosis, it is in marked contradistinction to it. As interesting as are the general clinical considerations, the frequent occurrence of the disease and its anthropological relations are even more important."

As a matter of historical interest, it is worthy of note that Pick in 1891[10] suggested grouping the hebephrenia of Hecker and the catatonia of Kahlbaum together under the designation of dementia præcox.

The dementia præcox of today is, however, the disease so clearly and elaborately covered by Kraepelin in the fifth and sixth editions of his textbook. In his fifth addition[11] Kraepelin described a group of disorders due to disturbance of metabolism. Under this heading he included dementia præcox, catatonia, and dementia paranoides, all deteriorating processes:

"As dementia præcox we designate the development of a simple more or less high grade mental deterioration in the form of an acute or subacute mental disorder."

"The first accurate and in many respects classical description of certain forms of dementia præcox we owe to Hecker, who in 1871, subscribing to Kahlbaum's views, described under the designation of hebephrenia such cases as develop a variety of mania after an initial stage of melancholia quickly passing into a genuine deterioration. Hebephrenia in this sense will only in small part be included in the group designated here as dementia præcox. Daraszkiewicz for that reason extended the conception of hebephrenia to include the "severe forms" leading to a profound dementia. I

believe, however, that for the time being and for the reasons given above we should retain the designation of dementia præcox for this enlarged group."

This conception was elaborated more fully in his sixth edition in 1899.[12] His views, summarized briefly, were as follows:

"Under the name of dementia præcox it was our privilege provisionally to group together a number of disease entities which had the common characteristic of a termination in a characteristic deterioration. It would appear, in fact, that this unfavorable outcome is not without exceptions, but it is so exceedingly common that we for the time being must retain this same designation. Perhaps other names such as the "demenza primativa" of the Italians or the expression preferred by Rieger "Dementia Simplex," would be more suitable. From the known clinical and anatomical facts I cannot doubt that we have to do here with a severe and as a rule markedly retrogressive process in the brain cortex. Whether the course of the disease is definitely always the same must for the time be stated as entirely uncertain.

"From a clinical point of view and for purposes of classification three general groups of dementia præcox commend themselves. These are, however, without doubt associated through transitions from one to another. We will designate these forms as hebephrenic, catatonic, and paranoid. The first of these coincides with the dementia præcox previously described by me, and the second with catatonia, while the third includes the cases heretofore assigned to dementia præcox and even to paranoia and which quickly lead to a considerable degree of mental enfeeblement. The whole domain of dementia præcox corresponds essentially to the disease types previously described as "deteriorating processes." I must suggest this change in nomenclature because paralysis, senile dementia, and a series of other disease processes might be understood perhaps as being included in the deteriorating processes."

The simple form of dementia præcox as described by Kraepelin was covered more fully by Diem[13] in 1903:

"It is not a very rare occurrence in experience to find that young people heretofore healthy and with a promising future, sometimes earlier, sometimes later, about the time of puberty are reduced in efficiency and become indifferent and unproductive, following the educational course of their comrades of the same age with an effort and sometimes with aversion, ultimately obviously not being able to keep up, and have to give up the career originally chosen. Young students, for instance, leave their college or uni-

versity, sink to a lower social level, and attempt to earn a living as clerks, penmen, translators, gardeners, instructors, or tutors. It is hardly to be said that they enter into their new life with resignation. Usually they are entirely indifferent to the fellow students and classes they have left, as if there was nothing special or important in the affair. They adapt themselves soon to the new situation and do very well for a long while, but one rarely hears of their making another change of their own accord or on the initiative of others and returning to their former social position. It is hard to determine whether we are dealing with the so-called infant prodigies or a simple cessation of development or whether we should speak of an actual retrogression of acquired efficiency. That both of these factors are concerned is out of the question."

"A summary of what has been said shows that, in addition to the clinical picture of hebephrenia, catatonia, dementia paranoides, and other paranoid forms which terminate in the characteristic deterioration of dementia præcox, there exists another type ending in the same terminal state, leading to the same disorder of the intellect and the emotions, but in its onset uniformly simple and progressive without special prodromes, the disease developing without episodes or remissions, without definite manic or depressive moods, without hallucinations or delusions, and without the characteristic peculiarities of the other forms, so-called, of dementia præcox-catalepsy, tics, affectations, mannerisms, stereotypies, negations, mutisms, etc."

In his eighth edition[10] Kraepelin in 1913 spoke of dementia præcox as including a "group of clinical pictures having the common symptom of a characteristic destruction of the internal associations of the psychic personality affecting particularly the emotional and volitional spheres." . . . "Although wide differences of opinion still exist on many points, the conviction seems to be gaining ground more and more that dementia præcox on the whole represents a well-defined disease entity, and that we are justified in regarding the majority at least of the apparently dissimilar clinical types here described as the manifestations of a single disease process." He defined the various forms of this disease as follows:

"Simple progressive deterioration as described by Diem under the designation of "dementia simplex" consists in an imperceptible and complete impoverishment and breaking down of the entire mental life."

Of hebephrenia or silly dementia he says, "In this disease picture there stands out, particularly with the progressive deterioration of the mental life, an incoherence of thought, feeling, and conduct."

"As the third group of dementia præcox I should like to group together, under the designation of simple depressive or stuporous dementia, those cases in which, after an initial depression, with or without the appearance of stupor, a terminal mental deterioration gradually develops."

"Those cases which progress to the marked development of phantastic delusions we group together in the fourth form of dementia præcox—depressive delusional dementia."

"The next large group includes those cases in which severe and protracted excitements develop."

"The first sub-group which on account of its course we may designate as the circular form shows the nearest relationship to the disease picture just described in that it also begins with a depression and usually manifests active delusions."

"As a second sub-group, the agitated form, we bring together those cases in which the disease begins with an excitement and then immediately or after more or less frequent remissions and relapse passes into the terminal stage."

"In close relation to the cases brought together here we have to consider a small group which either in the initial stages of the disease or throughout its entire duration follows an outspoken periodic course; these amount to less than two per cent of all cases."

"The excitements of dementia præcox constitute an important part of the clinical form—catatonia—which we must now consider. Under this designation Kahlbaum described a disease picture which in turn presents the symptoms of melancholia, mania, and stupor, the unfavorable cases being accompanied by confusion and deterioration, and is furthermore characterized by the appearance of certain motor seizures and inhibitions—in other words, the catatonic disorders."

"In many respects a dissimilar picture is shown by those cases in which the essential symptoms are delusions and hallucinations; these we characterize as paranoid forms. The justification for including them with dementia præcox I get from the fact that in them sooner or later the delusion formation is invariably associated with a series of disturbances which we find everywhere in the other forms of dementia præcox."

Cases "which do begin with a simple delusion formation but which in the further course exhibit still more clearly the peculiar destruction of the mental life and particularly the emotional and volitional disturbances which characterize dementia præcox may be grouped together under the name 'Dementia Paranoides Gravis'."

"As a fourth form of paranoid dementia præcox, I believe still another group should be added, those which on the one hand show a similar develop-

ment and the same delusion formation as the paranoid disorders just described but which on the other hand terminate in a characteristic mental enfeeblement." These he would call "Dementia Paranoides Mitis."

"A last very characteristic group of cases, the discussion of which might be included here, is formed by the patients with confusional speech." These are the schizophasias of Bleuler.

Kraepelin's views on dementia præcox led naturally to a serious consideration of this important subject. The mental mechanisms primarily involved in this disease were widely discussed. Meyer, in an article in which he reviewed the whole subject in 1906,[14] expressed himself as follows:

"The general principle is that many individuals cannot afford to count on unlimited elasticity in the habitual use of certain habits of adjustment, that instincts will be undermined by persistent misapplication, and the delicate balance of mental adjustment and of its material substratum must largely depend on a maintenance of sound instinct and reaction type."

Hoch's study of "shut in" personality, so-called, was of considerable interest[15] and destined to receive a great deal of attention. He described it as follows:

"Persons who do not have a natural tendency to be open and to get into contact with the environment, who are reticent, seclusive, who cannot adapt themselves to situations, who are hard to influence, often sensitive and stubborn, but the latter more in a passive than an active way. They show little interest in what goes on, often do not participate in the pleasures, cares, and pursuits of those about them; although often sensitive they do not let others know what their conflicts are; they do not unburden their minds, are shy, and have a tendency to live in a world of fancies. This is the shut-in personality."

This is the "schizoid" mechanism of later years, a subject which was discussed at great length by Bleuler[16] and introduced as follows:

"The dementia præcox or schizophrenia concept has never had any scientific limitations. Like every other mental disease, this group of psychoses is separated from the normal or the psychopathic by social viewpoints (inability to support themselves, to fit into their environment, etc.). The characteristics of the disease are found in a milder form not only in latent schizophrenics but in the previous history of the actually psychotic and in the later history of the improved and 'recovered' cases as well as in their rela-

tives, and have now been found by Kretschmer in the normal individual and those springing from normal families where, according to him, they form a definite psychic type which he contrasts with cyclothymia. Finally, I believe they can be demonstrated in everyone, although in definitely varying degrees. So the expression 'schizoid' now designates a type of psychic entity and psychic reaction which is more or less apparent in everyone, appears in the form of schizophrenia in its pathological exaggeration, but is observed in its milder expression in those heretofore designated as schizoid psychopaths without reaching a degree which we would call psychotic."

The forerunner of the various analyses of the mental mechanisms involved in dementia præcox was Wernicke's contribution on "Sejunction" in 1900. He summarized his views on this subject in his clinical lectures as follows:[17]

"I shall take up here, as the first patient, the case of a gardener, Rother, which incidentally, temporarily, even if rarely, shows hallucinations. How is it possible, we ask ourselves, that in the same brain such a large number of false notions and judgment can exist with reality, and at the same time with formal logic well retained, apparent clarity, and with a complete grasp on the situation? Now, gentlemen, on the other hand, in view of the history of the development of the present condition, the answer cannot be in doubt. It was the acute mental disorder which led to this looseness in the structure of the associations. We will indicate this process of loosening by the appropriate name of sejunction, and cannot but recognize a defect, a separation of continuity which must correspond to a definite loss of capacity of association. That the various ideas and thought complexes in the brain do not exist independently but in close connection and are finally absorbed into the ego, depends, in the last analysis, on the integrity of the associations. The very fact that the inconsistency of his different false ideas is not known to the patient himself suggests that the associations of all higher connections to one entity, the ego, have been lost. The man is made up of a number of different personalities at the same time, as it were, and we can best boldly describe his condition as a 'disintegration of individuality.' That this shows up so little in his outward behavior, and particularly in his vocational ability, is a coincidence and depends on the unimportance of the demands made upon the personality in this case as a result of his occupation. The monotonous occupation of a gardener is in close relation to other vocations, such as farm workers, many factory employees, and especially to simple manual and mechanical trades. In vocations which demand the resources of a complicated personality, such as a judge, a physician, a manufacturer, the destruction of the personality becomes permanently manifested in his occupational ability.

"Gentlemen, we will see later that there is much evidence of a disturbed secondary identification which forms the symptoms of the acute mental disorder and is explainable on the assumption of the same processes of sejunction. The changes in the consciousness which result from the disturbance of identification also are to be attributed to sejunction.

"We know, further, that aside from recovery and a falling off of the mental content there is still a third outcome of the acute mental disorders, a dementia or deterioration of various grades. The dementia, as we shall see later, depends likewise upon the sejunction process, which we can only describe hereafter as a loss or reduction of the association efficiency. In the acute mental disorders, before the definite recovery there is often a period observed, sometimes longer and sometimes shorter, in which after the subsidence of the acute disease the results of it are seen in the form of a change in the mental content or in a quantitative loss in the association efficiency. This, whether it be a paranoid or deteriorating state of an acute mental disorder, is also an approach to restitution.

"All of these considerations, then, point to the process of sejunction as showing the real nature of the acute mental disorders. As is shown in the Rother case, the demonstrated sejunction is readily seen in many old cases. In other cases the unmistakable progress in the changes of content and in the same chronic terminal process, although it is less noticeably accomplished.

"It will depend, then, upon the stage which the sejunction reaches whether the disease pictures finally progress to a defect state—dementia.

"Gentlemen, we see that the sejunction hypothesis serves as the key to the understanding of the acute as well as the chronic mental disorders, at least for those most important manifestations which we can look upon as symptoms resulting from the brain disease. It is also not disputed that there is a series of other symptoms unexplained. I mean those which we look upon as irritation symptoms, such as hallucination. Regarding these, the best known pathology of the organic brain diseases gives us no information, for even the most common irritation symptoms in this field, the localized convulsions and contractions, are, as far as their etiology is concerned, entirely unknown."

Wernicke's analysis of mental mechanisms was based on his assumption of the existence of what he termed a "psychic reflex arc." This presupposed the presence of psychosensory, intrapsychic, and psychomotor tracts. He cited the depressed form of manic-depressive insanity as an illustration of an intrapsychic hypofunction. Excitements were attributed to an intrapsychic hyperfunction.

Catatonia was referred to as the most striking example of a psychomotor disorder. Stuporous states were explained on the grounds of a psychomotor hypokinesis, and physical overactivity was interpreted as a hyperkinetic or parakinetic process.

This brings us up to one of the most important, perhaps, of all the contributions relative to the mental mechanisms involved in dementia præcox, that of Stransky[18] in 1909. Speaking of the symptoms shown by patients suffering from that disease, he said:

"There is one which above all characterizes them, a very particular one, shown in such distinctness as appears only in gross organic diseases, and even there rarely, a conspicuous dissociation of the whole psyche, a more or less deeply seated disorder of the physiological coordinated association of the intellectual with the emotional activities, the noopsyche with the thymopsyche, if I may be permitted to use these expressions again. The severe intrapsychic disturbance of coordination may remain as such or continue for a longer or shorter time; it may finally progress very early to a severe defect—a defect which still has the peculiarity that it more strongly and deeply involves the emotional than the intellectual sphere. It ends in an emotional deterioration, and while the same weakness is hardly ever lacking in the intellectual field, it does not reach the degree which results in the corresponding affective life.

"This disturbance of coordination manifests itself in various ways and in various degrees. The simplest form in which it appears is a definite dissociation of the affective expressions and the ideational content in so far as these succeed in projection. The patients laugh in sad and weep in pleasant situations, or show more often a conduct directly contrary to the affect. Reactions of an affective type accompany their intellectual reactions, which never show associative relation of contrasts (a relation the theoretical and practical significance of which Bleuler has recently realized) but must be designated as inadequate in every respect. The patients grin or smile, perhaps, where, under the circumstances, hearty laughter, sadness, or some intermediate emotional tone would be the corresponding reaction. They are thrown into the most violent rage by occasions of an entirely indifferent type, even to the patient himself, as we sometimes subsequently learn from him. Fear, shyness, or resistiveness is shown where there is not the least apparent occasion for it, and even when the patient knows no conscious reason for it. Confidence, obtrusiveness, and eroticism are replaced at one time perhaps in the same situation and under the same circumstances by embarrassment, diffidence, and frigidity. Very frequently one emotional tone dominates from the first all conscious situations in which the

patient finds himself; a definite dullness and apathy, a striking poverty of affect which may continue for a longer or shorter time and often makes a startling contrast with the clearness and presence of mind which the patients show at the same time. Cool and composed, without the winking of an eye, without reacting spontaneously in any way, without any evidence of initiative, and without expressing any wishes, the patient submits to his internment in the hospital. Peace and quiet seem to be spread about him. On being questioned, the same patient possesses the most accurate information regarding time and place, the persons in his environment, everything that goes on about him. He retains his school knowledge, his memory functions faultlessly, he even holds his own creditably in an 'intelligence test' and answers in the negative the question as to whether he feels sick; but he does not understand the significance of a longing for freedom, a feeling of sadness over his situation—all of this seems to be extinct in him. A dismal impression is created by the icy coldness with which these patients submit without emotion to their fate, somewhat similar to the dismal impression of the dreamy epileptic whose mental state shows a definite symptomatic relation to many forms of early dementia. Not only in reference to the relation of the ideational content to the emotional tone within a definite space of time, but in their succession also this same uncertainty is shown, the same irregularity, the same chaos. In abrupt succession, without outward, or inner, recognizable causes, moods and affects of an incommensurable type change, one after another, and all possible fluctuations of emotional life follow each other. Also in this relation we encounter the same ataxic tendency. This April-weather-like condition of moods and affects naturally leads to obvious comparisons with hysteria. It lacks, however, a tendency which the hysterical capriciousness exhibits, like every psychic manifestation developing from the soil of the hysterical character—the theatrical, the calculating, the playful, the dramatic. The irregular jumble of our patients leads back unmistakably to a much deeper seated process.

"The differentiation becomes particularly clear when, as is almost always the rule, this intrapsychic ataxia expresses itself also in a psychomotor manifestation of the inner life, when the noo- and thymopsychic impulses lack coordination which under normal circumstances determine their appearance and termination, and are interrupted by conflicting influences; when, therefore, conduct and movements of expression assume a tendency to the unnatural, the strange, the queer, the distorted, the grotesque, the 'constrained;' when they are looked upon not as a coarse organic disorder but as a higher order of intrapsychic disturbance, moreover; when they appear ataxic, inconsistent, contradictory, flighty, here too much, there too little, inadequate in everything, an unintelligible jumble perhaps of laughing and

yelling, startled and frightened—a "salad" of all imaginable impulses. It is the psychomotility, of course, by which our inner life projects itself, and on its manifestations, therefore, that we must base our conclusions regarding the inner life. If it is the conduct itself, the behavior of these patients, in other words, the psychomotor ensemble, which impresses the observer as being so characteristically "unpsychological." Last but not least, this refers also to the manifestations of speech. These, however, we will, on account of their great significance, consider later on.

"On the other hand, we will turn here, for the purpose of simplicity and clarification, to a series of other peculiarities which are often added to this disease picture. In the first place, we find dominant in these patients a certain tendency to repetition or decided perseverance derived from certain innervation impulses originating sometimes from without, sometimes from within. These impulses may be of an expressive pantomimic nature or they may relate to conduct impulses of any kind. In other words, they repeat again and again certain movements or combinations of movements without evident or recognizable psychologic cause, continuous or recurring at definite intervals of time or with a definite cause but without showing any relation to any outward or leading back to any inner situation, so that at times it leads to an impression of automatism. It results, thus, that movement innervations of the body or individual members produced from without or within, from impulses entirely unclear to the observer, often persist for a long time, usually in an apparently entirely unexplainable manner; also bodily attitudes of dramatic aspects may appear which are assumed by the patients in an entirely unrelated way and often retained for long periods or repeated from time to time. Dissociated from every evident psychological connection (a reminder of the intrapsychic incoordination which we have learned to be the characteristic feature of the disease picture), all of these peculiarities of speech and expression, conduct and behavior, again create an impression of fixedness, constraint, artificiality, affectation, and mannerisms, and it is the lack of composure, the absurdity and the distortion in their behavior that is again "psychoataxic" and causes these stereotypies, as many of these psychomotor anomalies are called, often giving one the impression of a bizarre appearance, of a more or less theatrical posing or grotesque caricature.

"With these fundamental symptoms already considered, there is another tendency inseparably associated with it, one which has been inaccurately called suggestibility. If innervation impulses are liberated directly or indirectly in such patients, it happens not rarely that the motor impulses resulting persevere spontaneously or that they, changing at the will of the observer, adapt themselves more or less slavishly to the impulses given them

by him. If one places the arm of such a patient in a chosen position, it remains there for an abnormally long time and remains there until the muscles are exhausted or until the time when its posture is modified at the will of the observer. Marked echo phenomena are also not rare."

In discussing the speech disorders of dementia præcox, he said:

"In the domain of speech, the disorders of the emotional life, the disturbance of intellect, the disorders of psychic coordination, the disturbance of psychomotility, all of these reflect themselves here individually and in competition."

Urstein[19] also referred to "intrapsychic ataxia," but his conception of it differed somewhat from that of Stransky:

"With intrapsychic ataxia Stransky also identified the incongruity between the emotional and intellectual life, while I described as 'splitting' the incoordination within the intellectual, the emotional, or the volitional spheres. Through this dysharmony within the various components I endeavored to show, so far as it may be possible, that a patient who, for instance, is confused and incoherent in speech may express himself at the same time in a correct and coherent writing, or the reverse. From the ataxia I also derived the often enormous inconsistency between subjective complaints and the absence of any objective expression of them. Furthermore, I pointed out in this intrapsychic disturbance of coordination the cardinal feature of dementia præcox which determines the differential diagnosis between that disease and manic-depressive insanity."

Bleuler established another landmark in the history of dementia præcox with his 420-page work on schizophrenia in 1911.[20] His original contribution on this subject is worthy of an extended consideration, as it has never appeared in English. For obvious reasons only the more important topics covered can be included here:

"I call dementia præcox schizophrenia because, as I hope to show, the splitting of the various functions is its most important characteristic. For convenience I use the word in the singular, although the group probably includes other diseases."

"Zweig and Gross followed similar lines: first they spoke of 'dementia dissecans,' later, 'dementia sejunctiva.' As has already been shown, the word 'dementia' is very unsuitable, which brings us to the second proposition, that the sejunction concept of Wernicke is not defined as it should be to properly describe the disease, and that it was already described by others (first by Gross and afterwards by Weber) in a very indefinite sense, thus opening the door to a further unprofitable discussion."

"With the name dementia præcox or schizophrenia we designate a group of psychoses, chronic or progressing in episodes, which may come to a standstill in any stage, or regress, but which allows of no complete restitutio ad integrum. It is characterized by specific alteration of thinking, feeling, and relation to the outer world not found elsewhere. In every case there is a more or less well defined splitting of the psychic functions. If the disease is well established, the personality loses its entity, being represented by first this and then that complex; the opposing influence of the various complexes or trends is inadequate or lost; the psychic complexes do not converge as in the normal to a composite of trends with a resulting entity, one complex governing the personality for the time, while other groups of ideas or trends are split off and become wholly or partially inoperable. Moreover, ideas are often only partially elaborated and fragments of ideas are improperly associated with a new idea. The concepts even lose their integrity, losing one or more of their essential components and being represented only, in many cases, by several partial concepts.

"The association capacity is often dependent upon fragments of ideas and concepts. They become peculiar and odd, and would be unexpected in the normal. They often stop suddenly, at least in the conscious, in the middle of a thought, or, when they should stop, pass on to another thought (blocking). Instead of proceeding, oftentimes new ideas appear and neither the consciousness of the patient himself nor of the observer can be brought into association with the earlier mental content. Primary disturbances of perception, of orientation, and of memory have not been established."

"The Associations

"The associations lose their coherence. The thousands of connections guiding our thought are interrupted by this disease in an irregular way here and there, sometimes more, sometimes less. The thought processes, as a result, become strange and illogical, and the associations find new paths regarding which the following is known at this time: Two accidentally encountering ideas are brought together into one thought, the logical form of the combination being determined by the circumstances. Two or more ideas are condensed into one. Klang associations acquire an unusual significance, as well as the intermediate associations. The tendency to stereotypy results in the train of thought clinging to one idea, or causes the patient to recur again and again to the same idea. Above all, poverty of thought exists, even to monideism. Some one fixed idea acquired in some way governs the stream of thought in the form of fixation, the naming complex (des Benennens), or of echopraxia. Distractability is not uniformly disturbed in the various schizophrenic conditions. If the schizophrenic association disorders

are of a high grade, they result in confusion. Regarding the temporal interference with associations, we know of only two specially relating to the schizophrenic disorder—the pressure of thought, that is, the pathologically increased flow of thought, and the characteristic blocking."

"And now as to the significance: One symptom, mental or physical (pain, anasarca), is not a disease nor is a symptom complex. It would be a still greater accident if any one psychic or other syndrome should be equivalent to a disease, that is, necessarily be in the foreground of every case of this disease without appearing in other diseases. When one has found a symptom or a symptom complex in his patient, it is the beginning not the end of the systematization, the elaboration of a disease concept. Then one has to ask—In what association with other symptoms and anatomical findings does the symptom appear? What is the course, what is the cause of the symptom, and eventually, what fundamental disorder does it lead back to? The answer to the question brings us to the disease concept."

"AUTISM

"Autism is a direct result of the splitting of the psyche. The normal person has the tendency in his logical operations to apply everything pertaining to himself without affective valuation. In the schizophrenic a looseness of logic results in an exclusion of all associations opposing emotionally determined complexes. No one unnecessarily can in this way, without difficulty, find compensation in phantasies for unsatisfactory realities. The phantasy life may be in direct conflict with reality, but there is no conflict in the mind of the patient. They are brought together as far as they are in harmony with the affective needs of the patient. In the severe cases, the whole of reality is shut off from their continual sensory stimulations. They exist wholly in commonplace associations, in eating and clothing themselves. So the autistic mental content remains uncorrected and, to the patient, becomes a reality, while the subjective valuation of reality sinks to nothing. The patient who imagines that we had declared him sound hears the contrary from us daily. He understands the meaning of the word and can reproduce it, but directly afterwards represents his opinion as ours because he really cannot bring what we have said into logical contact with his ideas. The outer world furnishes him with a basis for his opinion and he utilizes it gladly. Under the circumstances, he avoids or falsifies the reality. So the patient who, to the question as to when he would be discharged, received the answer, when he became well, replied: 'But I can walk already.' He took, instead of the difficult proposition offered, another one which could be overcome, the cost of the journey."

"THE STREAM OF THOUGHT. SPLITTING

"In schizophrenia the accustomed association paths have lost their stability. Associations which ordinarily are regularly carried out are discontinued; instead, material is associated that is normally not associated with thought formation. So close connections, the essential part of a concept, may remain unused; instead, but not necessarily, entirely new paths may be found. The father thinks of himself in certain associations as the mother of his children, in which he ignores essential attributes of his person and instead substitutes the attributes of his wife. The difference in the associative affinity is, however, never entirely abolished. In the most severe cases the majority of the associations follow their accustomed paths for numberless casual correct concepts and fragments of thoughts still continue. Under which influences and according to which rule the exceptions take place we only know in part. Many schizophrenic associations appear 'casual' to us. We see, however, that systematic affective processes break many association threads and form others. Instead of the concepts and ideas, often only fragments of them, or incorrectly associated conglomerates of such remnants guide the thought processes. These must, therefore, run off the track in many directions.

"Thus, the extreme klang associations, dependent upon the similarity of various sounds, are explainable. Words of a more similar sound are more frequently used for other words. In a similar way, concepts can change with each other, sometimes not having much in common. One patient finds that she is sending kisses when she wets the thread in her mouth. The 'displacements' taking place, one idea substituted for another in the thought processes, are a similar result of the incompleteness of the association complexes. The lack of logic prevents a correction of this fault. The frequent use of symbols is a special variety of this anomaly. Various concepts with common components may in this way become condensed, only the accustomed being considered—various loved ones, or various places of residence of the patient.

"Ideas and concepts which only partly enter into thought more readily become blended. That is the cause of the schizophrenic tendency to the generalization and elaboration of a symptom. Other causes are the lack of inhibition which one psychic function inadequately exercises upon other psychisms and the easier use of unaccustomed paths. When in thought the goal idea is not carefully followed, incoherence of all kinds results. The patient loses himself in by-associations, he is distracted as he would not be otherwise, and on the other hand does not notice outer processes which under the circumstances he should notice. If the associations are not directed along accustomed paths, logical weight may be attached to accidental con-

nections. What the patient sees may be associated with something to his liking contrary to the logic of the circumstances (he has broken a window because the doctor wears glasses).

"Other association disorders of various kinds have their origin in this frequent loss of the goal ideas. The outer associations, for instance, are favored by the 'sentiment d'incompletude' which readily appears in incomplete thinking. The naming complex (das Benennen) and restraint under certain circumstances are to be explained in that way. The thoughts do not progress for various reasons, for instance, loss of affect or clouding. Also the intermediate associations may be brought about in various ways. Of importance in regard to the loss of a goal idea is the analogy to the disorders of attention in the normal. Naturally, the logical operations suffer most. Many ideas and concepts which come into consideration are, on the whole, not involved; others are not fully thought out. The concept 'father' may be thought of only as a parent, a partial concept, and be changed to mother. So, many logical operations come to an incorrect conclusion.

"The anomalies so far covered are so unmistakably results of the primary association disorder as to be recognized by anyone. There are, however, indirect consequences of the disturbed relation between association and affectivity which only appear as a result of certain causes but nevertheless become of great importance in the disease picture. Logic and affective requirements often stand in opposition to each other. The affective life becomes of greater importance in every disease which weakens logical processes. While the intellectual thought processes as the result of experience have chosen certain paths, the affects direct the associations of the corresponding trends (obtaining pleasure, avoiding the disagreeable). They encourage the agreeable associations and avoid the formation of the ones which do not suit them. They give the ideas other values so that, for instance, the dangers of a desirable undertaking are underestimated, while those of an undesirable one are exaggerated, as if one changed the decimal point several places in a mathematical calculation. In the normal, the affectivity merely determines the essential course of the conduct; only in great excitement or when the subjectivity interferes, do the logical operations normally become falsified in the real sense. In a logic weakened by disease, however, the affective processes encroach upon the otherwise clear and well founded association of details. So the wishes and fears are falsified in the mind. What one wishes and fears becomes to him reality.

"The most characteristic operation of affectivity in schizophrenia is blocking. It is of itself no pathological symptom. We see it in the normal when overcome by emotions, in terror, in anger, even occasionally in joyful surprise. Children, imbeciles, hysterical individauls, who for entirely different

reasons are very easily upset by their affects, very readily become blocked. Where we can trace the appearance of a blocking in our schizophrenics there is always a complex or a disagreeable emotion involved. The natural conclusion is that the general and protracted blocking in catatonic states is an exaggeration of similar phenomena. We can then not differentiate these blockings from the more transitory ones. They sometimes develop before our very eyes. The schizophrenic tendency to a continuation of agreeable manifestations (stereotypies) contributes also to the development of these general blockings with, however, a very definite tendency to generalization. We usually see that blocking, which in the first instance related only to some definite thought, quickly becomes general so that, as a rule, nothing more is to be initiated. Kraepelin attaches importance to the point that opposing impulses can lead to blocking and are naturally more nearly related to the will than to the intellect. That is obviously correct. With the distraction of impulses there is often associated an opposing impulse, more the elaboration of another side of the same process than a new one.

"Often there is an impression that the loss of interest plays a part in the development of the symptoms, leaving them stationary after the first interference with the train of thought. Furthermore, other impediments inhibit the train of thought in catatonia with stuporous conditions. Obviously, then, blocking appears as a result of the affect or an impediment of thought. On the other hand, can the patient, if the psychic processes are continuously inhibited in any way (toxins or compression of the brain), become normal again temporarily through an exertion of the will? Here we have, not a suddenly developing general blocking, but the opposite—an exaggeration of the impediment through an affect. There all of the opposing affect is more strongly repressed than in the normal, and the corresponding one just as abnormally increased. So that it finally results that opposition to the affect-toned idea is no longer possible. The aspiring schizophrenic dreams only of his desires. The prevention of their realization does not exist for him. Thus, complexes of ideas which are joined together more through common affect than through logical connection are not only formed but also fixed. Through lack of use, such complexes, changing association paths to other ideas, lose their relations to adequate associations, that is, the affect-toned idea complex defines itself more clearly and acquires still greater independence (splitting of psychic functions).

"All (normal and pathological) psychic processes, affective as well as logical, have, in addition to the positive tendency, the exclusion of affiliated materials, also the negative one of inhibiting all unrelated psychisms. The best known result of this tendency is the 'narrowing of consciousness,' that is, the inability of the normal individual to think simultaneously of differ-

ent things. If the associations are now lost, primarily through the original association disorder and secondarily through the demarcation of complexes, the connecting as well as the inhibiting influence of the various ideas is lowered or entirely suppressed. Thus it becomes clear that simultaneously more complexes function in the same psyche and incompatible ideas may co-exist. The patient can, while he thinks of some definite thing, hear voices, have compulsive ideas, and perform acts related to an entirely different idea complex. He sees in the examiner his hospital doctor and at the same time another person who is an enemy of his.

"In consciousness there is in schizophrenia, naturally, at one given time only one complex. Always perhaps the autistic and the realistic thought processes continue simultaneously and very often we see an intimate mixture of ideas belonging to different complexes in conscious thought. That the complexes function in the unconscious is shown by this. They appear suddenly further developed in that, for instance, strong delusional systems spring at once into consciousness; at any moment they are ready to assimilate experiences (delusions of reference); they express themselves directly in hallucinations, in mimicry, in unconscious or compulsive actions, or in stereotypy. Whether a complex at any one given time is conscious or not is inconsequential. This theory gives no consideration to the existence or absence of conscious qualities of the various complexes. We have grounds for the assumption that one conscious psychic function is separate from one in the *un*conscious, and that they are associatively connected with the conscious personality. Without reference to the fact that there are unconscious processes which, aside from the absence of conscious qualities, are identical with the conscious psychic processes, one can as little understand the schizophrenic symptoms as the other complicated psychic manifestations.

"When, as is probable, there are inhibitions in the normal psyche, the disparate association material can only be reached with difficulty, and the transition to another subject requires unusual strength (affects, distraction from without), then must this type of inhibition naturally fail in schizophrenia. In any event, we see in the schizophrenic associations the exclusion of normal associations, as well as associations at the improper place. It is for that reason that the thoughts so easily find their way into by-paths and entirely foreign associations may emerge from a thought process. Through this lack of inhibitions the many types of mingling of various ideas become clear. This goes so far that even the affect-toned complexes, although they show a greater independence than in the normal, often combine or become mixed in fragments.

"What has been said regarding schizophrenic associations makes it obvious that the association of ideas of one complex with another does not need

to follow logical laws. Therefore the absurdity of such a jumble. The separation of the complexes without the omission of those inhibitions cannot be absolute. They are all more or less associated with the ego and can at least influence each other through the personality.

"And still their isolation is most characteristically shown in relation to the personality. Instead of combining and showing a resulting united trend, the schizophrenic ego is controlled now by this, now by that, idea complex. The patient can carry on an interesting conversation with the physician only to abuse him in the next moment in an entirely illogical way. He may be very solicitous about his relatives and show hatred towards them immediately afterwards, or show the utmost indifference to their fate. He may in one moment fight for his existence with greatest endeavor, and in the next sacrifice it for some ridiculous reason.

"So the patients, dependent upon their complexes, appear to be split into different personalities. Nevertheless, the ego is entirely destroyed in only the most advanced cases. Usually the patient knows who he is, he knows his past, he is oriented for time and place, everything that is not interfered with by some interposing complex. All of these not unessential components of the personality exist in a certain relation with the different complexes. If one considers these intellectual components as an essential part of the personality, one cannot say that there is a splitting. They become, rather, the football of the complexes. If, however, one considers the trends as the measure of the personality, then the schizophrenic has as many personalities as complexes—personalities which are more or less independent of each other.

"Always after the splitting, the stronger intellectual components of the personality are changed. As long as the patient abuses the doctor he is to him his enemy, the shoemaker N—, while he is otherwise well oriented. If he claims to be the Kaiser, then during the association of the grandiose complexes with the ego an essential part of the patient's past is removed and replaced by delusional ideas. Under certain circumstances, real and delusional ideas may be united in a delusional explanation. While the delusional conceptions function, correct orientation is usually undisturbed but more or less split off from the ego. While the patient is ready with his abuse of the physician as the shoemaker, he knows very well all of the time what the doctor has done as a physician. During long-continued dream states, with the systematic recognition of the surroundings, a correct orientation is also shown, and particularly can the patients afterwards give a surprising account of the actual occurrences, at the same time arranging things in order, while delirious alcoholics or epileptics, whose entire per-

sonality takes part in the delusions, can only after careful deliberation straighten things out or with great effort be drawn out of their pathological state, and after the delirium they reconstruct the actual past only with difficulty.

"Splitting is the preliminary condition in the most complicated manifestations of the disease. It impresses the whole symptomatology with its particular stamp. Underlying this symptomatic splitting of definite idea complexes, however, we have previously found a primary looseness of associative processes which leads as definitely to the abnormal splitting as does the concrete concept. Under the name of schizophrenia I include both types of splitting which often blend into one in their actual operation.

"Schizophrenic splitting is again only an exaggeration of physiological processes. In the normal individual various complexes may co-exist more or less dissociated and become further elaborated in the unconscious or in dreams. The personality becomes different in content when the affect changes. A friend in the course of a conversation makes a very disagreeable remark. He is unable to add this experience to the picture which he has always had of his friend. He is irritated, thinks only of the bad side, and forgets all of the good in whole or in part and gives way to acts which he would not otherwise commit. The angry individual has become an entirely different person.

"There are all varieties of schizophrenia, from hysterical manifestations to autismus, dream states and paranoid syndromes, but nowhere any principal psychological difference. We must point out that in such deviations from the normal, let us say, to avoid inconveniently large numbers which would certainly be more correct, there are thousands of associations inhibited or abnormally diverted, in the excited schizophrenic, probably hundreds of thousands, and in the dreamy types, millions.

"What Gross understands as 'disintegration of consciousness' is the same as our 'splitting.' Consciousness cannot disintegrate, however; only its contents. We find, moreover, the splitting in the unconscious as well as the conscious and the 'disintegration, cannot involve the specially firm union of various association complexes. We therefore prefer the term 'splitting.' The word 'dissociation' has for a long time also been used to describe the same process. It covers other things such as the shrinking of the conscious content of paralytics, and may therefore give rise to misunderstandings. To a great extent our concept 'splitting' corresponds with Wernicke's 'sejunction.' We cannot employ the term, however, because the conception of sejunction is somewhat more comprehensive and is an anatomical and physiological one. Sejunction, for instance, leads to an obstruction of the psy-

chokyms, which seek other paths, reach inadequate parts of the brain, and result in hallucinations and delusions. All of that we would exclude from our concept of splitting. Foersterling looks upon the 'splitting of consciousness' as an increase in the psychomotor disturbances. I cannot go into this conception fully."

Bleuler's schizophrenia was very comprehensive.[21] To use his own words, it included

"many atypical melancholias and manias of other schools (as well as hysterical melancholias and manias), the most of the hallucinatory confusions, many of the amentias described by others (our conception of amentia is much narrower), some of the forms belonging to acute delirium, Wernicke's motility psychoses, primary and secondary dementias without special designations, the most of the paranoias of other schools, especially the hysterical paranoias and almost all of the incurable hypochondrias, nervousness, compulsions and impulsions."

To these he added the various "juvenile and masturbation forms," some of the degenerative psychoses of Magnan, many prison psychoses, and the Ganser symptom complex.

In 1930 Bleuler, in an article on the primary and secondary symptoms of that disease, defined the schizophrenic process in the following interesting words:[22]

"A disorder of the thymo- and noopsyche—an alteral relation to the world and to oneself—an intolerable feeling of inferiority—intolerable because of a projection of one's own feeling upon the surroundings—delusions of persecution—a sensation of influence by the environment as by bodily hallucinations and voices of a definite personality—acts of violence on those persons."

In the fifth edition of his "Psychiatry," Bleuler offered the following on the delimitation of schizophrenia:[23]

"The schizophrenic concept seems to many much too broad. 1. It includes the majority of mental diseases—which is no argument against its correctness. 2. Recovering and deteriorating diseases cannot be the same—that is a petitio principii (phthisis!) and in this instance is yet to be proved. It is also incorrect to say that evidences of deterioration (affective deterioration, intellectual, speech, or personality damage) are characteristic of schizophrenia, for there are numerous cases which do not show these symptoms for months, years, or decades, but deteriorate later in a typical manner. Until one has found other criteria (if there are such), such a differentiation is

entirely misleading. (Good and bad prognoses are possible to those who for the time adhere to the entity of the concept.) The most earnest effort, that of Kraepelin, to separate out paranoid cases with an especially well-preserved personality, as paraphrenia, has also been shown to be untenable by catamnestic investigations (Wilh. Mayer). 3. The clinical picture varies as a rule—no one has been able to point out satisfactory delimitations, for the same patient who presents a definite picture today may be entirely different tomorrow, except that the picture still remains within the described forms of schizophrenia. There is nothing to do, therefore, at the present time but treat schizophrenias as one great group entity, not because we feel certain that they cannot be separated, but because no one has been able to separate them yet. It will always remain an entity in a definite sense as a group, with varying limitations here and there: if one compares it in symptomatology, course, heredity, anatomy, pathology, and etiology with all other groups (organic, manic-depressive, epilepsy, neuroses, infections, intoxications, oligophrenias), it proves definitely separable, at least incomparably more so than the "diseases" which have heretofore been separated out from this schizophrenia group. Uncertainties of diagnosis in individual cases should not be confused with uncertainties in fundamental principles. It is obvious that now and then it is impossible to determine whether one is dealing with an acute episode, a schizophrenic process, or the schizophrenia-like picture of a psychogenic reaction in a schizoid psychopath. In studies of heredity it is important to remember that the biological disease concept 'schizophrenia' must include the common latent schizophrenia; otherwise, only the manifest forms are to be considered."

No one, perhaps, has made such an intelligent and important comparative study of the views of Kraepelin on dementia præcox and those of Bleuler on schizophrenia as was contributed by Ewald in 1930.[24] It is well worthy of quotation in full.

"It became a custom with us to substitute for the concept of Kraepelin's dementia præcox the concept of schizophrenia, as Bleuler coined it, and as a rule we use both expressions as synonyms. It seems to us that the diagnostic difficulties which now arise in the schizophrenia question have their cause, partly at least, in this change of concept, and we believe that they can be fully appreciated from an historical standpoint only.

"Bleuler, too, originally started with the concept of dementia præcox. However, he studied first and foremost the psychic manifestations of his dementia præcox patients. He designated as essential symptoms the emotional deterioration, autism, and incoherence of thought, and having these cardinal symptoms in mind he gave to the same disease-group the name

'schizophrenia.' But this schizophrenia remained for him a well-defined disease; it remained an organic psychosis which leads to a specific defect. Yet, subsequently interest was more and more turned towards the psychological analysis of dementia præcox, and one tried particularly to determine specific schizophrenic symptoms and to define them. In doing so, however, the domain of schizophrenia began to widen farther and farther until it spread to the realms of the psychopathic and even of normal life. Incoherent thinking, for instance, could also be found in the phases of puberty; autistic tendencies were found in many psychopaths and even in normal character variations. These were accordingly classified as schizoid psychopaths or as schizothymic characters. Moreover, for some writers puberty became a mild schizophrenic episode which everyone had to get over in his life with varying intensity; the schizoid or schizothymic, however, during this period became a latent schizophrenic.

"The factor of the malignant course, which for Kraepelin was to such an extent determining, was more and more thrown into the background. The psychological cross-section became conclusive, with certain typical modes of experience, like the experience of the end of the world, of a quality of strangeness, or a mood of the dismal, and others of the kind. Yet often enough one could observe that such patients recovered afterwards and stayed well for the rest of their lives. But only for the reason that the factor of the malignant course was so much neglected, could it come to pass that any authorities claimed that schizophrenia was a psychosis which showed a quite pronounced tendency towards recovery. The purely psychological attitude, furthermore, made it possible for the psychotherapeutists to take up schizophrenia and to suggest its treatment by psychoanalytical methods. One might think that our insane asylums by now ought to be remarkably empty. Finally, various gifted individuals have been labelled as schizophrenics after they had recovered from a psychosis, even though they became entirely well and productive, and more hyperaesthetic than formerly. The diagnosis was based merely on the psychological symptoms, looseness of thought, hallucinatory experiences, and a paranoid attitude towards the environment. For example, I assume that it never occurred to Kraepelin to consider Strindberg as a schizophrenic, although Jaspers, Storch, and numerous other well-known psychiatrists would have had no doubt as to his having been a schizophrenic and having recovered from a schizophrenic psychosis. For obvious reasons, I will undertake no discussion of this question; it serves merely as an illustration of diagnostic discrepancies.

"There are, however, on the other hand, several writers of the psychological school who could not but feel that we are on the road to a definite clini-

cal entity if we follow this purely psychological orientation, and they returned accordingly to the diagnosis of 'schizophrenic disorders.' In doing so, they came again much nearer to the old dementia præcox concept. On the whole, however, we find that the center of gravity changed entirely from the biologicoclinical side to the psychological side of the problem.

"It seems to me that schizophrenia or the term 'schizophrenic' as it is interpreted by the psychological school and as it is again and again explained psychologically and analyzed by Bleuler, Berze, Jaspers, Gruhle, and many others, should be looked upon primarily as a psychological reaction type, merely as a syndrome in the sense of Hoche, but not as a disease entity. This means that if a patient presents a schizophrenic picture and, as we say, has schizophrenic experiences, then it is not at all established as yet in our opinion that we have to deal with a case of dementia præcox, even though we often might think of it with a high degree of probability. What we have before us is merely a schizophrenic symptom complex, from which we cannot with a sufficient degree of certainty reach a conclusion as to the nature of the basic physical process. We have no right, accordingly, in the presence of a schizophrenic symptom complex to assume a different attitude than if we were confronted with a manic-depressive or with a delirious symptom complex, or with a twilight state. Of course, everybody knows manic-depressive pictures appear in a beginning general paralysis or in the first stages or in the subsequent developments of dementia præcox. Often enough, one cannot say from the psychic cross-section alone whether we have to deal with a manic-depressive psychosis or merely with a manic-depressive syndrome on some other basis. As far as the catatonic symptoms are concerned, this attitude is almost generally recognized nowadays. A catatonic symptom complex does not warrant in itself the diagnosis of dementia præcox. What is right for one should be fair for another. As we are not afraid to recognize a manic-depressive symptom complex of non-specific character apart from the manic-depressive psychosis as a disease entity, and as we do not hesitate to admit a catatonic picture on a different basis apart from catatonic dementia præcox, so should we not be afraid to accept, above all, besides dementia præcox, a non-specific schizophrenic symptom complex, for instance, the incoherence syndrome and the schizophrenic reaction-type syndrome.

"You will say that this has already been done with the recognition of a schizophrenic reaction type, but, for one thing, this recognition pertains primarily to the catatonic pictures, at least from an historical point of view, and secondly, it is a fact that it is a widespread practice among psychiatrists to diagnose a case of schizophrenia as a disease entity, that is, a dementia præcox, as soon as there appears in the cross-section of the psy-

chosis a certain looseness of thought, more marked hallucinations, or even only a more marked tendency towards a paranoid reaction. The schizophrenic type of experience, the mood of the dismal, the autism, the ambivalence, etc., make no difference. As soon as one of these symptoms appears the diagnosis schizophrenia, alias dementia præcox, is usually already made. It is, of course, true that we have succeeded through the fine analyses of Bleuler, Berze, Jaspers, and Gruhle, all of which were made on dementia præcox patients, in coming very near to the psychological nucleus of the schizophrenic disturbance. But who can prove, even if we suppose for a moment that a hypotonia of consciousness is the primary cause of the psychological schizophrenic disturbances—I say, who can prove that this hypotonia of consciousness (or the disintegration of the associative tension) cannot just as well have its origin in an entirely different biological basis as in the specific præcox degenerative basis? It seems very remarkable that Berze, in his fine analysis of the schizophrenic thought-disturbance, finds the typical flight of ideas as a form of incoherence and indeed in the early dementia præcox one meets very often with a typical flight of ideas. Consciousness is interfered with, grows gradually hypotonic, and, after passing the stage of flight of ideas, there develops an incoherence of thought. Could it not be possible, then, that a non-schizophrenic biological affair, for instance, a manic-depressive disturbance, could produce a deeper disturbance of incoherence instead of the more usual flight of ideas in a predisposed case, and yet entirely recover afterwards as a result of its own biological law?

"Certainly a glance at the somatic side of the problem is justified, more especially the question as to whether or not other biological causes than the specific schizophrenic process can, temporarily, at least, produce the basic symptoms of a schizophrenic picture. The experience which we have had during recent years shows that even the apparently specific schizophrenic end states, as Berze separated them in such a commendable way from the acute process symptoms, may be simulated by an exogenous disease, such as general paralysis treated with malaria. In every large institution one may find one or more cases of this description. Yet typical cases are not frequent. We have here in Erlangen two such patients whom we observed for several years. Certainly, they would be diagnosed as schizophrenic end states if we did not have the history of general paralysis and the meager neurological and serological residuals. These two cases are not remarkable because of more or less temporary or isolated hallucinations, but because they represent typical schizophrenic end states, namely, the fact that they live in two worlds, now in the world of reality and again in a delusional hallucinatory world, and all the while the sensorium is perfectly clear.

That means that we have to deal with schizophrenic end states on a non-schizophrenic basis. Similar pictures are shown, as we know, by a number of cases of post-encephalitic psychosis with a marked schizophrenic coloring, which have been described in current literature. Why should not the acute schizophrenic process-symptoms occasionally develop on another than a specific præcox basis? There is no pathognomonic psychological symptom. The intensive work which has been done in the last years, especially in regard to the psychology of schizophrenic disturbances, shows that the idea that dementia præcox is an organic defect-psychosis has been almost forgotten. It is true that recognized authorities usually stress the fact that in their opinion schizophrenia remains an organic psychosis, and yet one talks again and again of pathognomonic psychological symptoms, so that in the end the general impression is created that we have to deal with a purely psychologically-defined 'disease.'

"My point is this: Psychology helps us only to supply and to study reaction types, the coupling of symptoms and syndromes, which of course may occur with special frequency in a particular disease. As to our classification, however, we must strive to remain in the biological-somatic domain. Whoever, on the basis of a schizophrenic symptom complex, diagnoses instantly and with certainty a schizophrenia in the sense of the disease dementia præcox, is guilty of a decided transgression into another category—even though he might be right in 90 per cent of the cases. Of course psychology remains always the most valuable indicator in the conclusions which we draw in regard to the physical side, but the course of the disease must often correct the results which were gained with psychological methods only. The great confusion which arose in the dementia præcox-schizophrenia question is caused by this unfortunate dissension, namely, by the battle cry of psychologically-determined schizophrenia on one side and defect-disease dementia præcox on the other side, as it is determined by its course. These difficulties will be overcome only after it becomes entirely clear to us that, by means of psychology, we can, after all, discover and comprehend reaction types. The classification, however, must be based on the somatic side.

"It is true that we know very little as yet about the somatic processes of dementia præcox. So much more do we have to depend at present, first and foremost, on the study of the course and of the resulting defects. That we have to deal in dementia præcox with a somatic defect-psychosis, which means with processes of nerve degeneration, we learn from the demented and states, as they are generally recognized. It is obvious that these degenerative processes may be primarily of a cerebral origin or that they may develop via the endocrine system. It is for this reason that we sympathize so thoroughly with Kleist's concept of dementia præcox as an

hereditary-degenerative system-disease, in which the 'system' concept remains an entirely open question. We ourselves look for this system in a phylogenetic and embryological-functional direction as yet rather than in strictly localized anatomical brain lesions.

"One recognizes in the foreign literature, too, the difficulties which arose in the dementia præcox-schizophrenia question. However, we cannot see a real progress in Claude's solution, for instance. He places schizophrenia beside dementia præcox, with its 'more massive' physical symptoms, because the difficulty arises at once that one does not know exactly what should be designated as 'massive' physical symptoms. In addition to all this, it is impossible to separate his cases of schizophrenia, which finally show a mild deterioration, from the end stages of dementia præcox. After all, the line between schizophrenia and schizo-mania or schizoid states remains entirely uncertain on account of this appreciation of schizophrenic disturbance which is determined wholly by psychology. The possibility remains open, therefore, to extend the limits of schizophrenia according to one's taste until it includes even the normal psyche.

"In conclusion, however, I wish to emphasize the warning not to neglect the disease dementia præcox for the psychological study of the schizophrenic manifestions, the schizophrenic reaction types, and the schizophrenic experiences, not referring to the excellent and subtle writings of the psychological authors. However, we believe that no one has any right to make biological diseases out of psychological reaction and experience types. It seems that one is not always conscious of this danger while applying too generously the schizophrenic concept and entirely losing sight of the clinical course.

"I hope I am not misunderstood if I decline to substitute for the word dementia præcox the more practical and more striking expression schizophrenia. Perhaps one should speak, rather, of 'dementia schizophrenica,' or if one takes offense at the word 'dementia,' one should speak with Kleist of 'schizophrenic defect-psychoses.' From these one must separate the 'picture' of schizophrenia, which is meant in a purely psychological sense. (This picture will practically override the schizophrenic defect-psychoses to a great extent, of course, but it does not necessarily include the biological factor of a progressive destruction.) I object, however, to the disease concept of 'schizophrenia' so commonly deferred to recently as showing a purely psychological content, a psychologic experience or reaction type which entirely overlooks the biological background—the malignant process and defect nature of the disorder."

Various other contributions have been made from time to time on the mechanisms involved in dementia præcox. Kretschmer at-

tempted to study the dream in its biological as well as psychological relation. He proposed a so-called multidimensional as contrasted with the single approach to diagnosis with special consideration of constitutional as well as characterological factors. Birnbaum proposed a distinction between the pathogenetic basic symptoms and the pathoplastic, which have to do with the form of the disease and lend color to the etiological basic type. Jaspers, in support of Bleuler's view, attempted to differentiate between the actual attacks or episodes of the disease and the reactive states of schizophrenia, the attacks producing a change in the personality of the individual, while after a "reactive state" the patient returns to his previous condition. Kretschmer also attempted to correlate certain physical types described by him as the asthenic and athletic with the schizoid personalities. None of these contributions have been revolutionary in character nor have they added anything of great value to our knowledge of dementia præcox.

Timmer[25] made a very interesting attempt to explain dementia præcox on the basis of the theories of Pavlow relative to conditioned reflexes. He stated, for instance, that

> "In schizophrenia, induction is unusually strong, probably as the result of a lesion of the brain cortex. Induction, which in normal individuals is always influenced by new stimuli and remains normal, is so strong here that the outer world cannot adequately influence the governing centers in the brain cortex. The individual loses his harmonious contact with the outer world and begins to react as a schizophrenic. When the process reaches an advanced stage, ideas lose their associations and the stream of thought becomes disconnected, abrupt, and often broken. The patient shows the association disturbance described by Bleuler. If induction has not advanced so far that thought processes are broken down, then the formation of greater complexes is possible, but they may not be adequately controlled by stimuli coming from the outside. The 'insufficiency of psychic activity' described by Berze also appears here."

The psychoanalysts have, of course, had something to say regarding the mental mechanisms in dementia præcox. Jung[26] turned his attention to that subject as early as 1909. He explained the apparently meaningless expressions of that disease as nothing more or less than symbols of buried complexes. Some remain in their original forms and others are subjected to change. Complexes which

are an expression of feelings of inferiority or injured pride may reflect themselves in delusions of suspicion and persecution. Unfulfilled desires may be elaborated into a delirium or be expressed by ideas of grandeur. Complexes which are incompatible with the ego of the individual are changed or displaced and thus become unrecognizable.

White[27] offers some interesting suggestions as to the delusional content of this psychosis:

"The relation of the delusion to the complex is often obvious if one is familiar with the more important of the infantile material. A man believes himself pregnant, that a child is in his stomach. This is obviously a regression to the period when as an infant he had not understood that gestation was a particular function of the female. Another patient enucleated his eye (castration symbol; a colored man of about forty years of age invented a perpetual motion machine (compensation for impotence); a man tries to invent the greatest cannon on earth (compensation for small penis complex); a homosexual man of the 'sissy' type made wild claims of physical prowess, fighting ability, and incessantly swore and used vulgar language to demonstrate his toughness (overcompensation of homosexuality); a woman complains that her sister's husband follows her through underground passageways and shoots electricity into her genitalia and anus (anal erotism); an oral erotic woman starves herself in order to be tube fed; oral erotic patients often cut their throats while under the erotic pressure; patients frequently say that God talks with them or go to Washington to see the president (father complex); in severe grades of introversion they sit in a dark corner, head on breast, arms folded and legs and thighs flexed (intra-uterine position); a young woman says her real parents are the King and Queen of Norway (Œdipus phantasy); etc. Of course much of the delusional material is not so obviously related to infantile material and must be worked out at length with the individual to determine its meaning."

"It must not be forgotten that a præcox may have, however, complex reactions exactly like that of hysteria and the psychoneuroses. To that extent such a patient is hysterical or psychoneurotic."

Freud himself[28] has contributed to this discussion. He finds that since 1908 the analysis of dementia præcox or schizophrenia shows that this disease is characterized by a peculiar failure of the object of interest, the libido is turned towards phantasy creations and later becomes introverted. No new object is sought for and the ego remains in an objectless existence. The characteristic speech

disturbance shows, according to Freud, the same changes in words that images are subjected to in dreams, often with condensation and displacement. The object itself is replaced by a verbal substitute. Attention is diverted from the object image to the verbal substitute. In consciousness the image of the object persists with a verbal image but in the unconscious it is the image of the object which is important. While the flight from reality in schizophrenia is a profound fundamental disturbance, the verbal image remains intact. This is held by Freud to represent the first stage of recovery. He sees in abstract thinking in the normal a strong resemblance to the thought disorder of schizophrenics.

Kraepelin has not agreed at all with the views of the psychoanalytic school on these subjects. In his eighth edition[29] he made the following comment on the Freudian contribution:

"Here we meet everywhere the characteristic fundamental features of the Freudian trend of investigation, the representation of arbitrary assumptions and conjectures as assured facts, which are used without hesitation for the building up of always new castles in the air, ever towering higher, and the tendency to generalization beyond measure from single observations. I must frankly confess that with the best will I am not able to follow the trains of thought of this 'metapsychiatry,' which like a complex sucks up the sober method of clinical observation. As I am accustomed to walk on the sure foundation of direct experience, my Philistine conscience of natural science stumbles at every step on objections, considerations and doubts, over which the lightly soaring power of imagination of Freud's disciples carries them without difficulty. I also hold the view that many speeches and actions of our patients are not so nonsensical as they appear to us and that sexual emotions certainly play a considerable part in them. But as I only succeed very exceptionally in explaining my own dreams to a certain extent, although the preliminary conditions are certainly as favorable for that as possible, I must not only say explicitly that the statement, that a dream "always discloses itself as a sensuous elaboration of a complex," is wholly imaginary, but I am also unable to pluck up courage to give any credence to the disclosures which are yielded by the 'analysis' of the processes of consciousness of our patients which are infinitely more difficult to understand. Certainly anyone who can decide to regard the utterances of the patients sometimes literally, sometimes as the expression of the contrary, sometimes again as 'symbols' of any other ideas whatever, who in all these expulsions, displacements, concealments, finds his way with confidence, will not find it too difficult in the end to discover in a fable of Gellert a back-

ground of secret incestuous thoughts, jealous, masochistic, sadistic or homosexual emotions."

Repeated efforts have been made to prove that dementia præcox is an endocrine disorder pure and simple. It has been demonstrated that there is an endocrine dysharmony and that there are numerous glandular disorders in those suffering from dementia præcox. This is without doubt true. It has not been shown, however, that there are more disorders of the endocrine glands in dementia præcox than there are in the other psychoses or in the non-psychotic population. It is hardly worth while to attempt to study the endocrine diseases in dementia præcox until there has been some agreement as to what constitutes that disease. Many of the cases of so-called schizophrenia studied by the endocrinologists almost certainly do not belong in the dementia præcox group. Williams' comments on this subject are well worthy of consideration:[30]

"It may be considered as established only that certain relations exist between dementia præcox and endocrine disturbances and indeed that occasionally in individual cases constitutional endocrine abnormalities appear before the outbreak of a stormy psychosis, that further, the appearance of obvious disorders at the time of marked endocrine disturbances is favored, and finally that certain forms of schizophrenia, particularly catatonia, are often associated with outspoken endocrine symptoms. That endocrine disturbances are, however, the cause of schizophrenia is not proved. The question may be raised as to whether, on the other hand, the brain disorder is primary and does not in its turn precipitate the endocrine manifestions.

"The influence of mental factors on the progress of endocrine functions is sufficiently recognized; emotional shocks affect senses and lactation, both, furthermore, are influenced by hypnosis. Shock will produce an increase in adrenalin production; mental strain, anxiety, and fright preciptate, not rarely, a Basedow's disease; moreover, the war with its mental shocks has caused an increase in thyrotoxic disturbances. As the influence, therefore, of affects and emotional factors on endocrine disturbances is not to be doubted, the question may be raised as to whether we cannot now formulate from these processes a picture based on brain physiology."

Before considering the relation of purely psychogenic factors to dementia præcox, something must be said of the influence of heredity and the part played by pathological changes in the nervous system. The question of heredity has been investigated exhaustively

by Rüdin.[31] He studied over 700 cases from non-psychotic parents. His studies show that the incidence of præcox in these cases is only 4.48 per cent, while the cases having one præcox and one non-præcox parent showed a percentage of 6.18. Where one parent was psychotic but neither had præcox, the incidence of that disease was 8.21 per cent. With one psychotic parent and alcoholic complications present, the percentage was increased to 15.78. With both parents psychotic, the præcox rate jumped to 22.7. On the other hand, very few of the children of old standing præcox cases showed that disease.

M. Bleuler[32] studied 100 schizophrenic patients in the Bloomingdale Hospital and covered in all 2,634 members of their families. He found the same rate of appearance of schizophrenia in the brothers and sisters of non-psychotic parents that was found by Rüdin. He is of the opinion that there is no biological unity or uniformity in the schizophrenic group. In the prepsychotic life they were not significantly schizoid. They showed a stout dysplastic bodily type. The tainted cases were, as a rule, lighter, in no case more severe, than those in the families of which there were no secondary cases of schizophrenia. There was no evidence of any tendency towards deterioration. Schizoids and schizophrenics appeared in the children of parents who were not schizoid, and in the relatives of schizophrenics many moral personality defects were found.

Many pathologists have studied the nervous system in an effort to determine whether dementia præcox is an organic or a purely functional disease. Alzheimer, Nissl, Mott, Southard, Josephy, Hechst, and many others have found definite pathological lesions to which they attribute the disease. On the other hand, Meyer and Dunlap have consistently stated that there is no known pathology for dementia præcox. This subject was reviewed recently in a very interesting way by Spielmeyer.[33] He has found this problem "insoluble." He agrees with Dunlap regarding the sources of error. Intercurrent bodily disease produces changes in the brain cells. Terminal conditions also bring about similar lesions. The cell loss reported is found in normal brains. He has found fatty substances in glial cells and vessel walls not only in normal senile cases but in the young as well. He does not regard this as pathological.

Necrobiotic linear areas with intact blood vessels may be produced by circulatory disturbances which result from various causes and constitute a definite mechanism but not a definite disease process. It occurs in epilepsy, eclampsia, and in manic-depressive cases. "Certainly I know many cases in which our anatomical analyses revealed no deviation from the norm. I could not, however, conclude, as many do, that this negative finding makes apparent the functional and not organic nature of the process of dementia præcox. In medicine and in natural science it is in general the rule that only the positive findings prove something, but that the negative result often only states that we are not able as yet to achieve the positive." . . . "I agree completely with Dr. Orton in this negative respect, namely, when he refuses such a proof of the functional existence of schizophrenia, both as a matter of principle and because of our general experience." . . . "The changes in clearly demonstrable cases consist of a cellular loss in the third layer of the cortex as well as in the deep layers, sometimes with an enormous fat accumulation. In the acute stages we find active destructive phenomena in nerve tissue changes in the glia, and often abundant destructive products. I believe, therefore, on the basis of such findings that dementia præcox is an organic process. This Alzheimer thought twenty years ago and Nissl, too, stressed it. The aforementioned findings suffice, in my opinion, to establish the organic basis of this malady, but they do not suffice to separate this process and to establish it as an entity. And so we have not as yet a pathological analysis of dementia præcox. I cannot follow the optimism of many investigators who evaluate these findings more highly. For we find such indefinite cellular losses in entirely different organic psychoses. These findings only indicate the organic nature of schizophrenia, not, however, the anatomical diagnosis and the differential diagnosis which we need so very much."

Hechst[34] made a positive diagnosis of dementia præcox, postmortem, in a criminal case on a marked cell loss in the third and fifth layers of the cortex, in some areas diffuse, in others focal, independent of vessels, and without glial scars. The nerve cells showed shrinkage, sclerosis, and fatty degeneration. The patient had previously been diagnosed by psychiatrists as a schizoid psychopath without psychosis. Josephy is of the opinion that Hechst was perfectly justified in his findings.

This subject was discussed by Bleuler[35] in his recent address to the Massachusetts Psychiatric Society. On that occasion he expressed the opinion that

"When the disturbance is particularly severe, in acute mental aberration, catatonia and dyskinesis, it is accompanied as a rule by other symptoms, which we are rightly accustomed to regard as bodily: Raised or lowered temperature, albumen in urine, metabolic disturbances, gnashing of teeth, 'Flocklesen,' fainting fits or cramps, not infrequently followed by temporary paresis of the limbs or the language, pupillary disturbances, greatly increased idiomuscular reactions, vasomotor disturbances, edema, somnolence, disturbances of the chemistry of the body, especially of the liver functions, abnormal protein content in the spinal fluid. In many cases, too, the brain trouble is demonstrated from the psychic side by the fact that the confusions and delirium have absolutely the character of the 'exogene' as Bonhoeffer designates it. Many cases of stupor, with their general prostration of the elementary psychic functions, conception and train of thought, often point clearly to brain pressure, and on autopsy tense edema of the pia or brain swelling is found. In the various forms of such deliria, the fundamental similarity of certain symptoms or of the whole picture to other physiogenic conditions, intoxication, fever psychoses, epileptic absences, meningitis, encephalitis cannot be denied, and in all such cases we also find in the autopsy histological alterations of the brain tissue, which show some uniformity. But in all chronic cases, too, decreases in the amount of ganglion cells and certain changes in the glia, furnish a proof that we are in the presence of a brain lesion, of course not in the sense that the histological finding is the direct foundation of the primary psychic symptoms; it is merely an indicator of the existence of brain lesions, which, on the one hand, express themselves as psychic, and on the other hand as anatomical. Chronic histological findings always correspond with the clinical chronic picture, and acute changes, with acute ones. Organic symptoms are also the hyperkinesis and akinesis, which are likewise found in various diseases of the basal ganglia."

The relation between the purely physical and the psychogenic factors is difficult to determine. "Nevertheless," as Henry says,[36] "during the past quarter of a century considerable evidence has been accumulated which indicates that a personality disorder is really a psychobiological reaction and that the biochemical component is constant even though not readily demonstrable. This statement is supported by clinical and laboratory studies which call attention to the intimate relation between certain emotional states

and metabolic processes." As a result of extensive studies made along these lines, Henry reached the following conclusions:

"(1) There is a definite relationship between basal metabolic processes and emotional states regardless of the clinical type of personality disorder.

"(2) Elated, overactive, and overtalkative states are accompanied by acceleration of basal metabolic processes.

"(3) Depressed, underactive, and undertalkative states are accompanied by retardation of basal metabolic processes.

"(4) Apprehensive, tense, and agitated states usually imply an acceleration of basal metabolic processes, but this may be counteracted in some cases in which the feeling of depression is intense.

"(5) Apathetic states are accompanied by a retardation in basal metabolic processes, which is not as great, however, as that associated with feelings of depression.

"(6) It is probable that some of the so-called normal variation in the metabolic rate is due to the different emotional states presented by the tested individual.

"(7) The basal metabolic rate may be altered to a pathological degree with no other apparent factor than an unusually intense emotional state, and therefore the interpretation of the rate in any given case, regardless of the type of illness, requires the consideration of the prevailing emotional state of the individual tested."

White[37] sees in the understanding of dementia præcox a difficulty due to attempting to wholly separate the psychical from the physical. He feels that the symptomatology of the disease is only capable of interpretation "at the psychological level." He has expressed himself on this subject as follows:

"In the present state of knowledge, however, one is often unable to make any specific correlation between the physical findings and the mental symptoms, while on the other hand it is quite possible to express the symptomatology of the disease, to describe it, to, so to speak, reconstruct the psychosis purely in psychological terms. For the present, therefore, the disease must be described psychologically, and the explanation of the mental symptoms must be sought psychogenetically, without, however, forgetting that there are certain somatic changes which are pretty generally attached to the symptomatology of the disease process and which must ultimately be made to fit into the general rubric before a complete understanding of the entire situation is had. It will be seen, too, that this method of procedure helps to an understanding of many of the physical symptoms which otherwise stand alone and cannot be assimilated to the general concept.

"On the psychological side, then, dementia præcox is seen to be a certain type of reaction to a mental conflict, resulting in a splitting of the psyche and the out-crop of unconscious mental trends to the surface of the mental life. The patient is confronted with a situation to which he cannot adequately adjust, which is absolutely inacceptable and impossible, and he is therefore driven away by his incapacity to assimilate it and cast back upon himself. The battle of the opposing forces produces the disease picture which is the outward evidence of the effort on the part of the individual to reach a solution of the difficulty."

To this he adds the following:

"The general tendency at present is to think of the psychological conflict as primary and the various symptoms of disordered function at the physiological level as secondary. Circulatory and glandular imbalances and functional disturbances of various organs are thus explained as results of the primary emotional disturbances and the organic changes as results when such functional disorders are maintained for a long period and are severe in character. In many instances primary defects of the personality undoubtedly found in organic defects and such defects as well as those that are more obviously secondary, would appear to be mediated through the vegetative nervous system. They would include glandular (gonadal, etc.) deficiencies and imbalances, gastro-intestinal, cardiovascular and other organic inadequacies, and organic deficiencies such as the aplasias of the central nervous system. There is a wide field here for correlating generalizations which will undoubtedly show precox to be the result of relatively severe processes which in less severity occur in prognostically less serious conditions such as certain of the neuroses.

"From this point of view then precox is an especially severe manifestation of the individual's inadequacy to meet the biological demands made upon him to fulfill his biological destiny. The theory of a toxemia does not help, as such, to understand the results but on the other hand the toxemia can be understood, if it exists, as resulting from the general functional disturbances incidental to his unsuccessful struggle with his problems. Only under some such comprehensive formula as here indicated is it possible to arrange any of the multitudinous manifestations of this type of mental illness.

"A study of the dominating visceral tonicities and postural tensions in individual cases will demonstrate the nature of the psychological conflict because it will show the organs that are in a state of preparedness for carrying out unconscious trends which, however, are not permitted to express themselves but are kept inoperative by the force of repression."

With the exception of dementia præcox, Bleuler's psychiatry is not materially different from that of Kraepelin. In view of that fact, it is of some interest that schizophrenia, so-called, still includes the simple hebephrenic, catatonic, and paranoid forms originally described by Kraepelin. The one essential point of difference insisted upon is the splitting of the personality as the characteristic feature of the disease. As a matter of fact, that mental mechanism has very little, if anything, to do with dementia simplex and would not seem to be the factor of paramount importance in the paranoid forms. It does furnish the basis of catatonia, but even there it is not so clear-cut as in hysteria, where the highest development of splitting is to be found in its purest form. In dementia simplex, the simple form of dementia præcox or schizophrenia, we have nothing more or less than a gradually progressing intellectual deterioration with little if any splitting. In hebephrenia, which is a more highly developed process of identically the same nature, we do have the addition of various secondary or accessory phenomena which are of great importance. The essential feature involved in both of these conditions is, however, the gradual progressive deterioration with comparatively little evidence of any gross splitting of the personality. In catatonia, the catatonic form of dementia præcox or schizophrenia, what we are dealing with is, above all, an autistic withdrawal from an environment with which the individual finds himself unable to cope. He resorts to the only means at his disposal of escaping from an impossible situation. It is true that from time to time he breaks more or less through the wall which separates him from the outside world and a catatonic excitement is the result. Eventually a genuine deterioration ends the struggle. In the paranoid conditions and paraphrenia we have no initial intellectual impairment, no withdrawal from the environment, and no massive splitting of the personality. The essential feature of these disorders is an intellectual incoordination. As a result of this "intrapsychic ataxia," as Stransky described it, the individual develops judgment defects, with more or less systematized and firmly-fixed delusional ideas which are otherwise entirely inconsistent with his intellectual endowment. Carried to the highest stage of development, we have the typical schizophasia of Bleuler, or the incoherence of Kraepelin.

These conditions all have one thing in common—they end in deterioration. They all represent the reactions of an inadequate personality to conflicts of various kinds. The type of reaction, however, varies. The result in dementia simplex is a gradual intellectual disorganization in the presence of an irresistible and impossible situation. In catatonia the victim escapes from an unfavorable environment by a complete withdrawal to a new world in which there are no conflicts. In the paranoid conditions the intellectual mechanism becomes disorganized, resulting in an incoordination which clearly reflects itself in corresponding symptomatic expressions. As White expresses it:[27]

"The hebephrenic type represents a failure to develop any adequate defenses.

"The catatonic endeavors to shut out from consciousness his conflict by a supreme effort at repression.

"The paranoid, while not so apt to recover, is able to build a more or less elaborate world of phantasy in which he gets along fairly well."

An intellectual incoordinative mechanism would appear to more logically explain dementia præcox in all of its various expressions if we are to assume the entity of that disease. There is often, as was pointed out by Stransky, a disharmony between the intellectual, the emotional, and the volitional spheres. This can readily be accounted for by assuming that the dissociation or splitting, when it occurs, is primarily due to a disorganization of the purely intellectual mechanisms which results in a corresponding incoordination of their functions and in some cases in addition to that a partial or complete loss of contact from time to time with the emotional and volitional fields of psychic activity. This hypothesis would explain, as Bleuler does not do, the appearance of schizophrenic deterioration. It is, of course, true, on the other hand, that Bleuler does not concede deterioration in all cases. This would appear to be due to the enormously comprehensive limitations placed upon the disease described by him. If we can eliminate from the picture the schizophrenic or dementia-præcox-like syndromes occurring during the course of other conditions such as psychopathic personalities, mental deficiencies, etc., the whole solution becomes clear. It would seem to be obvious that these syndromes are often the

expression of other and entirely different underlying fundamental disorders and do not constitute disease entities.

Patients are often brought to the hospital with a positive diagnosis of dementia præcox and show a fully developed schizophrenic syndrome which clears up entirely in a few weeks or in several months at the outside. Investigation shows that these individuals were in some instances feebleminded from birth, a condition which is found to be unchanged in any way after the recovery from the schizophrenic episode which was responsible for their coming to the hospital. There is no logical reason for the assumption that this is a combination of two diseases, mental deficiency and dementia præcox, or that the latter psychosis has been engrafted upon the former condition. There are at this time few, if any, reasons for thinking that the feebleminded ever develop a genuine dementia præcox. They are often subject to schizophrenic episodes just as they frequently develop other transitory attacks which are expressions of their fundamental deficiency and are not disease entities such as schizophrenia. That the feebleminded are subject to psychotic episodes has been known for centuries. Schizophrenic episodes occur, moreover, in psychopathic personalities, in epilepsy, hysteria and other psychoneuroses, alcoholism, senility, toxic and exhaustive states, and even in pellagra. They are very common in the involution period of life in individuals who have never before shown any suggestions of dementia præcox.[38] This is no more late schizophrenia than syndromes of the same kind in epilepsy are dementia præcox. It should be borne in mind here and always that Bleuler insists that dementia præcox and schizophrenia are synonymous terms.

That these episodic affairs do not belong in the dementia præcox group is shown by the fact that there have been no previous evidences of that disease in the patient's history which does show early suggestions of complicating factors such as psychopathic personality or mental deficiency, etc.; that the syndrome completely disappears in a very short time; that it is followed by no definite evidences of dementia præcox later and may never show any further schizophrenic suggestions; that the episode on close analysis is nearly always atypical in character; and finally that the recovery made is nearly always complete.

To insist, moreover, as Bleuler apparently does, that a mere schizophrenic coloring in a given psychosis automatically forces it into the dementia præcox group is no more logical than it would be to assign every excitement or depression to manic-depressive, or call all deliria alcoholic in origin. Marked schizophrenic colorings often appear in manic-depressive insanity,[39] in genuine involution melancholia, and in many other psychoses. A careful study of the history of these cases will show that they were originally psychopathic, intellectually defective, or showed some other complicating factor unrelated in any way to dementia præcox.

If Bleuler would designate the transitory episodic syndromes occurring entirely outside of the dementia præcox group, and unrelated to that disease, as schizophrenia, it would constitute an epoch-making contribution to the literature of psychiatry. It would entirely do away with the inconsistencies which have been so prominent in the views expressed by various authors relative to the recovery rate of dementia præcox, and would appear to be the most satisfactory solution of the vexing schizophrenia problem which suggests itself at this time.

As the result of a careful consideration of the voluminous contributions to the literature of dementia præcox and many years of clinical observation of these cases, the following conclusions would seem to be warranted:

I. Dementia præcox is a disorganization of the personality developing during the period of adolescence or maturity. It is characterized, in a general way, by an incoordination of mental mechanisms and is associated sooner or later with an intellectual deterioration without any definite organic basis which can be demonstrated at this time. Psychologically, it is the reaction of an inadequate personality to the difficulties of his environment. This inadequacy is not demonstrable in the intellectual field, but expresses itself in an inability to react, as the normal well-balanced personality does, to the difficulties encountered during the course of the educational, economic, sexual, emotional, domestic, or social life of the individual.

II. The inadequate personality defects may be classified as follows:

1. *Educational.* An inability to attain to the educational level consistent with the intellectual capacity of the individual. Feelings of intellectual inadequacy or inferiority. Failure of educational life in school or college.

2. *Economic.* The absence of any desire or ability to achieve a degree of economic success in life which is in any way commensurate with the intellectual capacity of the individual. This is variously expressed as financial difficulties, failure in occupational life, inability to obtain recognition and advancement, inability to obtain employment and hold positions, etc.

3. *Sexual.* The impossibility of adaptation to a normal sex life and adherence to accepted social and moral standards. Inability to meet the situations arising during puberty and adolescence; autoerotism; homosexuality; extra-marital relations; unsatisfied or repressed sexuality; illegitimate pregnancy; venereal disease, etc.

4. *Emotional* (*psychic traumata*). A difficulty in meeting the misfortunes and disasters of everyday life which should be reacted to adequately by the average individual without any abnormal disturbance of the equilibrium. Death or illness of relatives or friends; emotional shocks following storms, fires, burglary, assaults, accidents, murders, etc.; results of imprisonment; physical disease, pregnancy, childbirth, etc.

5. *Domestic.* A lack of efficiency and judgment in the maintenance of normal domestic adjustments. Family quarrels and dissensions; unhappy married life; infidelity; desertion; divorce; incompatibility; cruel and abusive treatment, etc.

6. *Social.* Failure of the individual to measure up to the social level warranted by his intellectual and educational advantages and adjust himself to the requirements and standards of organized society. Antisocial tendencies; failure to occupy the plan desired in society, church, or politics; conflict with the law; criminality; alcoholism; drug addiction, etc.

III. Dementia præcox, or schizophrenia, is a clinical entity—a psychosis the principal and characteristic features of which may be either: 1. A primary progressive deterioration; 2. An autistic or dereistic withdrawal from the environment; or 3. An intellectual incoordination; all of these types ending eventually in a partial or complete deterioration.

1. PRIMARY PROGRESSIVE DETERIORATIONS: prototype, the dementia simplex of Diem, including also the hebephrenia of Hecker.

2. AUTISTIC TYPES: prototype, the catatonia of Kahlbaum.

3. INTELLECTUAL INCOORDINATIONS: prototype, the schizaphasias of Kraepelin and Bleuler. In this group belong also the paranoid types and the paraphrenia of Kraepelin. The characteristic feature is an intellectual incoordination with more or less lack of harmony between the intellect and the emotions or volition, corresponding in a general way to the intrapsychic ataxia of Stransky. The primary difficulty, however, would seem to be in the intellectual sphere.

It is not suggested or to be assumed that these cases are clear-cut, uncontaminated types incapable of modification or entirely free from complicating factors of any kind. In the first group, for instance, there are occasional evidences of the intellectual incoordination which is common to all three. Splitting is a secondary consideration here, if it exists at all. The characteristic feature is, however, the primary progressive intellectual deterioration which is evident from the onset of the disease. In the second group there is a definite massive splitting of the psyche, with some suggestions of an intellectual incoordination. The characteristic feature is, however, the autistic withdrawal from the environment. The incoordinative mechanisms explain this as well as the equally important picture shown in the catatonic excitements. The deterioration is secondary. In the third group the intellectual incoordination is the characteristic feature of the disease throughout. There is no initial intellectual impairment and no gross splitting such as is seen in catatonia and the psychoneuroses. The deterioration is again secondary. All of these groups show a well-defined, clear-cut intellectual incoordination and a permanent disorganization of the personality expressed psychologically as the result of a conflict of some kind and ending eventually in the deterioration which would appear to be an essential feature of dementia præcox.

Approaching the situation from this point of view, the dementia præcox—schizophrenia problem would seem to be materially simplified. Taking everything into consideration, the designation dementia præcox would, however, appear to be more nearly de-

scriptive of the essential features of the psychosis than is schizophrenia.

IV. Schizophrenic or dementia-præcox-like episodes, syndromes, or reactions not belonging in the dementia præcox group conform in a general way to the clinical picture of some types of dementia præcox but do not deteriorate and are distinctly episodic in character. They occur in the course of mental deficiency, psychopathic personality, somatic diseases, traumatic conditions, alcoholism, epilepsy, the involution period of life, and even in senility and general paralysis. The assignment of these syndromes to the dementia præcox group is undoubtedly what explains the recovery rate in that disease reported by various authors.

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# THE EPILEPTIC PERSONALITY---ITS PROGRESSIVE CHANGES AMONG INSTITUTIONAL CASES

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The so-called "epileptic personality" has, for many years past, been described by various writers.

Those who have written on it vary somewhat as to its characteristics from that of simple irritability to the most severe forms of personality derangement including supersensitiveness, hyperirritability, "religiosity," narcissism, uncontrollable outbursts of rage, furors and sexual assaults. These unfortunate individuals are pictured as cruel and ruthless toward their fellow men even to the extent of committing the most cold-blooded and brutal murders.

It is the writer's purpose to go over these traits and show that he feels these have been over-emphasized as regards the average epileptic.

To refer to the literature, L. Pierce Clark[1] states that "in every essential epileptic there exists from birth the typical epileptic personality consisting of narcissism, supersensitiveness and emotional poverty" and elsewhere states that these cases are "potential epileptics."

This, the writer, cannot agree with. True we do see essential epilepsy occurring in individuals showing these characteristics from a very early age but we also see tuberculosis, diabetes and various forms of nephritis in persons of essentially the same make-up and similarly in the mental field schizoid reactions but epilepsy does not necessarily follow, as Fraser[2] says, "There is a psychology of epilepsy but not of an epilepsy that does not exist." Epilepsy can be engrafted upon any type of personality the same as can any other disease.

Very many cases of epilepsy of no known cause occur in perfectly normal healthy personalities who up to the time of their onset mixed well in the world, showed no inferiority complexes and were by no means emotionally poverty stricken. It occurs in many cheerful, happy, carefree children, who show no evidence whatever of anything abnormal in the personality field up to the time of onset and often very little for sometime after the initiation of the disorder.

On the other hand the estimated proportion of the epilepsies to the general population varies and is believed to be between four and five per thousand. Should one select at random one thousand people from the general population there would be found many more than four or five individuals showing the same personality dysfunctions as those so firmly assured to belong to the epilepsies and yet these individuals would never develop convulsive phenomena. One need only look about him and study the reactions of people with whom he comes in more or less close contact to discover the truth of this statement.

Again we cannot say that the epileptic personality is greater in the essential cases than it is in the organic. For example the writer has in mind several cases of obvious organic epileptics who are much more markedly narcissistic, hyperirritable, given to rages and actual assaults upon their fellow-patients and attendants than are many of the so-called essential cases.

Wechsler[3] says, speaking of Clark's beliefs, "Many patients undoubtedly manifest this personality defect and while it does argue for a psychopathic trend, many children with that make-up never develop the disease."

McCurdy[4] made a very painstaking study of the personality changes taking place in epileptics, working among both extra and intramural cases and briefly summed up these as a loss of mental tension with consequent loss of interest associated with a failure of mentation in respect to normal stimuli and lists the epileptic as an egoist and states that he tends to be little else. That he is at the mercy of his environment and if he does not get his selfish return for any adaptive activity, denied by external events, he loses interest in this and unless some alternative interest is aroused he begins to deteriorate, loses his desire to appear neat, will beg for money, etc., substitutes expressions of piety for acts of virtue, shows memory gaps, lack of automatic mentation, becomes hypochondriacal, finally ending in complete deterioration to the vegetative level.

Wm. A. White[5] describes the epileptic as morose, irritable, suspicious and hypochondriacal.

Kretschmer[6] in his Psychobiogram, describes the epileptoid character as coarse, brutal, tense, explosive, abrupt and inclined to affective crises.

On the other hand Shanahan[7] says, "Anxiety, apprehension and fear play a great part in the development of their (the epileptic) mental outlook, and also restrictions on their occupations, pleasures and recreations, help develop the belief they are abnormal. They become sensitive to criticism and tend toward asocial habits."

W. Alden Turner[8] has investigated the temperamental qualities of a large number of young epileptics in private practice and the results do not confirm what has been described as the "epileptic personality."

Let us look at the sum total of the epileptic's reaction to his environment as seen in his extramural milieu and later to his institutional adjustment.

The vast majority of the convulsive phenomena occur in early life probably 80 per cent under 20 years of age and a large proportion of these probably at or near 60 per cent under 16 years of age. What effect has this fact on the personality of these cases?

First in the cases which develop say under 15 or 16 years of age, in the period of children's life when they are the most sensitive to external influences, and attitudes of those about them play such a tremendous part in their outlook on and reactions to life. We see a normal, happy child who has been getting along well in school, mixing with his fellows, in sports and social affairs on an equal with them. He develops convulsions and as a result is ostracized by his former playmates or friends, who now look upon him with fear and dread. He is eliminated from play and social gatherings. At school things are no better, the teachers do not understand him and grown-ups along with teachers are afraid of him with the result that he is shunned by society in general. At home he is shielded and all sorts of limitations are placed on him. He becomes over-pampered with the result that all his interests are directed toward himself and his physical condition, the fits.

The writer recalls a case of an epileptic boy who worked as delivery boy for a grocer. Upon entering a home to deliver groceries he stumbled and some of the family laughed. He immediately said, "I'm a poor boy who has fits and you must not laugh at me." This reaction was simply a reflection of the home protection that this boy had received. Many less serious traumata send children to a psychiatrist as behavior problems.

These cases are forced through deprivation on the one hand and parental pampering on the other into the development of personality changes that we see in some epileptics who have had convulsions for any length of time, particularly where the onset of the epilepsy occurs in the early impressionable age. The earlier it occurs the more apt are we to see childish personality traits predominating because there is undoubtedly an arrest of development in this field at a point before adult development has taken place, the earlier the age of onset the more nearly do the traits represent the early childish reactions. There are of course certain exceptions to this the same as there are exceptions to textbook pictures of disease. In the epilepsies as in everything else we should look for the average findings and enlarge on these, mentioning the less frequent characteristics as such and not placing so much emphasis on these that they become majors in the picture.

In those cases coming on in later life say 20 to 35 or 40 years we have psychic insult but from a little different angle. The interest here is directed more to obtaining a livelihood and providing for those dependent upon the patient for support. These individuals have gained the average personality through childhood and up to the adult level of personality development and we would not expect quite the same child-like reactions. Fear of loss of work together with uncharitable attitude of others to which they are subjected particularly the former tends to break their morale and they retreat to any protection they can find.

In no other defect or disorder do we find this attitude to be faced from the public quite the same, the feebleminded child will be tolerated or sympathized with for years, the halt, lame and blind we pity and protect. They are given school privileges of a sort, church and social life but let one of these have a convulsion, however, and the entire picture changes.

These points are brought out simply to show that there are ample etiological factors in the epileptic's relation with his fellow-men to cause peculiar personality changes without even considering any effect that the convulsion may have on the somatic structures, and yet if we consider the latter, one can but admit that while we do not know exactly what occurs in the brain during different types of convulsions we must be impressed with the fact that alternating

pressure and nutrition changes intracranially must have more or less effect on these delicate tissues.

The early epileptic's reaction in the emotional field differs but little from the normal. There is no fault-finding, no marked irritability, no great fluctuation of mood. Despondency practically never enters into the picture even in deterioration. They react quite normally to disappointment, loss of relatives and friends as also to pleasure and success. They soon make friends among their fellows in the institution and adapt well. They are apt to talk considerably about themselves for they are very grateful to one who will listen and try to understand them as they do not find these outside. In the beginning their attitude toward religion is about what is expected from the same social and intellectual level on the outside. They are usually sociable if given the chance, kind-hearted and truthful.

Their sexual libido is not altered to any marked degree in the average early case. They are over sensitive and a bit fearful due to the attitude of others toward them but not of their own volition and the extent of this depends chiefly on how long the symptom complex has forced deprivation upon them.

That the alleged personality traits do not occur in the majority of those suffering from convulsions is further substantiated by the fact that a conservative estimate of the number of epileptics in the State is placed at from 40,000 to 50,000 with not to exceed 4,000 in public and private institutions; therefore it is safe to conclude that the vast majority of these cases must be leading a fairly satisfactory existence extramurally; however, a careful study of the epileptic reactions among those cases outside of institutions would be very profitable if it were possible to conduct such an investigation on a large scale.

In the institutional case it is well to remember that as a rule the patient does not come under observation until he has had his dysfunctions for a number of years, thus many are already showing personality changes when first studied, others quite deteriorated and still others who show little or no change.

One of the first changes noted is that the patient become somewhat argumentative, a little later he will have periods of mild irritability usually in relation at first to seizures. At these periods there is an increase in productivity.

Memory failure is a rather prominent sign among many, by some it is self-recognized but by others this is not true. This memory defect is apt to have a "scattering" character. They are willing and anxious to help each other during seizures or injuries resulting therefrom. Next we may see an increasing lack of attention. A decreased response to external stimuli and this is shown in a delayed mental and physical reaction time. It gives one the impression that there is something slowing up the rate of travel of stimuli, associations, mechanisms, and different impulses in their nervous system. It has been held by some that the rather uneventful life they live in an institution together with lowered mental tension may account for the memory changes.

Fear of physical injury is not a characteristic in many cases and according to Shanahan[7] "even the most intelligent epileptic is so optimistic that he too often deliberately disregards advice as to avoiding danger."

Some few cases are egotistical but by no means all, probably no more than are found in the general population at large.

Next let us take an epileptic and follow him through this deterioration. At first we have the patient who adapts well, living in a cottage where the patients grade as normal. After a time there will be a complaint from the others that this patient is argumentative and quarrelsome, things do not go right. If left in this cottage with its higher standards to meet, the patient is very unhappy and by his irritability makes others dissatisfied. This usually increases and the patient has to be moved to a cottage where his mental level is more nearly approached with the result that for a time, months or even years he is reasonably happy and well adjusted. This situation will continue as above noted for a variable time, then another change is made necessary by the patient's progressive personality changes, bringing him into conflict with this class of cases and he is again transferred to a cottage having a still lower mental adjustment level where he will usually adjust fairly well for another variable period of time depending upon the rapidity of his mental deterioration. It is often in one of these deteriorating processes that he may become so hyperirritable that he will strike or assault his fellow-patients. However, the assaultive tendencies described by some writers with brutal sexual and murderous attacks

are relatively rare. During nearly twenty years' experience with a large number of cases the writer knows of only one fatal assaultive attack.

As to the sexual assaults they do not occur in the writer's experience in institutions. This is not because the opportunity does not exist, for female nurses work among male patients.

To follow the deterioration changes farther we find the patient is less irritable, things that formerly bothered him he now pays little or no attention to. These irritating stimuli fail to reach him. He is seen sitting about the day ward, giving little and increasingly less attention to his surroundings. When aroused he will move to another place and again assume the "absent" attitude. If teased by some of his fellows he will at times respond and at others these stimuli will not reach him. His face shows a vacant look, he pays no attention to his appearance. This process may continue until the patient becomes wet and soiled, sits about the ward in a semi-flexed position, circulation in extremities becomes sluggish and a state of vegetative existence is reached. Most of these badly deteriorated cases will feed themselves. They may eat with their fingers but lastly they may lose the ability to eat. During the deterioration there may be sexual perversions such as masturbation but the writer feels that these are quite rare as compared with some types of mental cases.

It should be realized that the above description of the deteriorating process does not occur in all institutional cases. We will see cases that have been in residence 10, 15 or even 30 years who maintain their original mental level quite well. They are able to conduct themselves satisfactorily and work at different industries or clerical work and give very good satisfaction.

The rapidity of deterioration is not predictable. Some cases never deteriorate but in others the process covers 5 to 15 years. Nor is there any proved relationship between frequency and severity of seizures to existence and rapidity of changes. One at times sees rapid deterioration in patients having numerous petit mal attacks and we are unable to say that major manifestations have any definite bearing on the rapidity of the process. These badly deteriorated cases resemble the hebephrenic schizophrenics quite closely but do not manifest the mannerisms of the latter.

There occur rather frequent periods of clouding, confusion, and active mental disturbance in epileptic cases with rapid, slow or very little deterioration. These states may produce transitory delusions or hallucinations in a small percentage of cases. It has not been the writer's experience that these types show any preponderance of the psychic sexual element.

Furors are extremely rare in institutional cases.

## Summary

1. We may have epilepsy super-imposed upon any personality but that an individual is a potential epileptic because of personality has not been established.

2. The average person developing epilepsy has, at beginning of seizures, the average personality traits existing in people in general if we eliminate the primary mental defects.

3. The subsequent mental reaction in these cases is influenced a great deal by the deprivation and home protection to which they are submitted.

4. Sexual and murderous assaults are not as frequent as some writers assert.

5. The deterioration in the ones who do deteriorate, consists of irritability, memory disturbances, failure of ordinary stimuli to elicit proper response, lack of interest in their personal appearance and surroundings, final loss of irritability with gradual decline to the vegetative level of existence.

6. Frequency, type and duration of convulsions have no definite bearing upon rapidity or certainty of deterioration.

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# THE PREVALENCE OF EPILEPSY IN THE UNITED STATES, WITH SPECIAL REFERENCE TO CHILDREN AND ADOLESCENTS*

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It is not a simple matter to determine the prevalence of epilepsy. Unlike mental disease, the statistics of institutional population and of first admissions do not afford an accurate measure of the extent of the disease. This is due to the fact that accommodations for the treatment of epileptics are insufficient in most parts of the United States, and to the additional effects of social and economic selection in the admission of patients. Consequently institutional statistics fall short of a desirable degree of completeness.

Surveys of restricted populations have often been made with respect to feeblemindedness, but similar surveys of the epileptics are rare. One of the few on record occurred in connection with the survey of Nassau County, New York,[1] undertaken by the National Committee for Mental Hygiene. As this survey was directed by expert diagnosticians, and as the population of the county was thoroughly canvassed, the statistical results may be regarded with confidence. It was found that 62.2 per 100,000 of the population were epileptic. The survey also found that 546.5 per 100,000 of the population were feebleminded. This testifies to the greater prevalence of feeblemindedness in the community. It is difficult to generalize from these results, however, as Nassau County is a comparatively small statistical unit, and is, furthermore, highly rural in character. There is a belief that epilepsy is more widespread in rural than in urban populations. If this be true, the rate of epilepsy in a highly urbanized state, such as New York, would be less than that in Nassau County.

A much larger population was sampled during the war, when over 2,000,000 men between the ages of 19 and 31 were called to the colors. It will be recalled that each was given a physical examination. The results were analyzed and published by the War Department in a volume entitled "Defects in Drafted Men," (page

1. See Survey of Mental Disorders in Nassau County, New York, July-October, 1916. Report prepared by Dr. Aaron J. Rosanoff Page 55.

* Prepared for and published with the permission of the Committee on Physically and Mentally Handicapped of the White House Conference on Child Health and Protection.

113). It is likely that the diagnoses were dependent to a large extent upon histories of convulsions. If this history were omitted or denied, many epileptics would have passed the physical test, at least until such time as a seizure occurred. The experience of the draft officials, however, was such as to indicate that these histories were freely volunteered, and when this is considered in connection with the nature of the disease, it is very unlikely that many epileptics escaped ultimate detection. For this group, therefore, we may consider the results as quite accurate.

It was found that 5.15 per thousand of the drafted men were epileptics. The rates varied from a maximum of 12.72 per 1,000 in Vermont to a minimum of 1.20 in South Dakota. Vermont's rate was far in excess of that of Maryland and New Hampshire which followed with 7.98 and 7.04 respectively. Drs. Albert G. Love, and Charles B. Davenport, the authors of the report, ascribe this to the large percentage of French-Canadians in Vermont, among whom epilepsy is alleged to be very frequent.

These rates may be compared with those for mental deficiency, which is often associated with epilepsy. The average rate among the drafted men was 12.06 per 1,000; the maximum was 30.90 which occurred in Vermont, and the minimum was 2.32 which occurred in Arizona.

It is again difficult to generalize from these results to the country as a whole. The drafted men came in an age interval which excluded children, and all those at the older age levels. As there are relatively few epileptics who live to an advanced age, the rate of epilepsy in the latter age group is very low. On the contrary it is high in the younger groups. Exactly how these groups should be weighted in comparison with the drafted men, it is difficult, if not impossible, to state. The two extreme age groups might possibly balance each other, in which case the rate of 5.15 per 1,000 would be a fair statement of the prevalence of epilepsy.

The statistics of institutional treatment of the epileptics, though not as good an index of its prevalence as those quoted above, nevertheless are of importance, because of the social and economic problems involved in institutional care, and because of the further fact that they give us pictures of the problem at varying dates. From the latter we may at least derive an idea of the relative changes in the frequency of epilepsy.

TABLE 1. FIRST ADMISSIONS OF EPILEPTIC PATIENTS TO STATE INSTITUTIONS FOR FEEBLEMINDED AND EPILEPTICS IN THE UNITED STATES AND RATE PER 100,000 OF GENERAL POPULATION

| Years | Males | | Females | | Total | |
|---|---|---|---|---|---|---|
| | Number | Rate per 100,000 population | Number | Rate per 100,000 population | Number | Rate per 100,000 population |
| 1922 | 973 | 1.7 | 694 | 1.3 | 1,667 | 1.5 |
| 1926 | 1,083 | 1.8 | 872 | 1.5 | 1,955 | 1.7 |
| 1927 | 1,140 | 1.9 | 810 | 1.4 | 1,950 | 1.7 |

Table 1 gives the statistics of first admissions of epileptic patients to state institutions for the feebleminded and epileptics in the United States in 1922, 1926 and 1927. The first admissions increased from 1,667 in 1922 to 1,955 in 1926. There was a slight decline to 1,950 in 1927. This resulted from a decrease among the females, who after growing from a total of 694 in 1922 to 872 in 1926, decreased to 810 in 1927. The males, on the contrary increased from 973 in 1922 to 1,140 in 1927. The rate of first admissions grew from 1.5 per 100,000 in 1922 to 1.7 in 1926 and 1927. The males increased from 1.7 in 1922 to 1.9 in 1927. Among females the rate grew from 1.3 in 1922 to 1.5 in 1926, and decreased slightly to 1.4 in 1927.

One must be cautioned, however, against concluding from these statistics there has been an increase in epilepsy from 1922 to 1927. They very likely indicate increases in institutional accommodations, with first admissions increasing accordingly. Thus Table 2 shows the admissions to Craig Colony for Epileptics from 1896 to 1929. It is obvious that there is no real trend. In some years the admission rate is low, in others it remains fairly constant, and in still other years, there is a decided increase. This means that, as a rule, the admissions are limited to the number of available beds, and that a sudden growth in admissions has followed an increase in the number of beds. As there has been a campaign for additional facilities for the care of epileptics, it is likely that the changes in the admission rates for the country may be explained in a similar manner.

TABLE 2. ADMISSIONS* TO CRAIG COLONY, 1896-1929

| Year | Admissions | | | Rate of admissions per 100,000 population | | |
|---|---|---|---|---|---|---|
| | Male | Female | Total | Male | Female | Total |
| 1896 | 69 | 76 | 145 | 2.1 | 2.2 | 2.1 |
| 1897 | 86 | 22 | 108 | 2.5 | 0.6 | 1.6 |
| 1898 | 62 | 95 | 157 | 1.8 | 2.7 | 2.2 |
| 1899 | 40 | 55 | 95 | 1.1 | 1.5 | 1.3 |
| 1900 | 223 | 117 | 340 | 6.2 | 3.2 | 4.7 |
| 1901 | 198 | 61 | 259 | 5.4 | 1.6 | 3.5 |
| 1902 | 116 | 66 | 182 | 3.1 | 1.7 | 2.4 |
| 1903 | 72 | 88 | 160 | 1.9 | 2.3 | 2.1 |
| 1904 | 107 | 70 | 177 | 2.7 | 1.8 | 2.2 |
| 1905 | 119 | 135 | 254 | 3.0 | 3.3 | 3.1 |
| 1906 | 115 | 79 | 194 | 2.8 | 1.9 | 2.3 |
| 1907 | 127 | 64 | 191 | 3.0 | 1.5 | 2.3 |
| 1908 | 172 | 145 | 317 | 3.9 | 3.3 | 3.6 |
| 1909 | 159 | 123 | 282 | 3.6 | 2.8 | 3.2 |
| 1910 | 169 | 91 | 260 | 3.7 | 2.0 | 2.9 |
| 1911 | 173 | 99 | 272 | 3.7 | 2.2 | 2.9 |
| 1912 | 130 | 97 | 227 | 2.8 | 2.1 | 2.4 |
| 1913 | 140 | 106 | 246 | 2.9 | 2.3 | 2.6 |
| 1914 | 122 | 86 | 208 | 2.5 | 1.8 | 2.2 |
| 1915 | 152 | 88 | 240 | 3.1 | 1.8 | 2.5 |
| 1916 | 91 | 48 | 139 | 1.8 | 1.0 | 1.4 |
| 1917 | 131 | 103 | 234 | 2.6 | 2.1 | 2.3 |
| 1918 | 95 | 75 | 170 | 1.9 | 1.5 | 1.7 |
| 1919 | 138 | 109 | 247 | 2.7 | 2.1 | 2.4 |
| 1920 | 139 | 122 | 261 | 2.7 | 2.3 | 2.5 |
| 1921 | 156 | 120 | 276 | 3.0 | 2.3 | 2.6 |
| 1922 | 163 | 106 | 269 | 3.1 | 2.0 | 2.5 |
| 1923 | 130 | 103 | 233 | 2.4 | 1.9 | 2.1 |
| 1924 | 139 | 88 | 227 | 2.5 | 1.6 | 2.1 |
| 1925 | 137 | 88 | 225 | 2.5 | 1.6 | 2.0 |
| 1926 | 119 | 113 | 232 | 2.1 | 2.0 | 2.0 |
| 1927 | 135 | 112 | 247 | 2.4 | 1.9 | 2.2 |
| 1928 | 154 | 122 | 276 | 2.7 | 2.1 | 2.4 |
| 1929 | 167 | 130 | 297 | 2.9 | 2.2 | 2.5 |

* Includes readmissions

The combined first admissions to state institutions in 1926 and 1927 are classified according to type of epilepsy in Table 3. For the country as a whole, 16.2 per cent of the first admissions were classified as symptomatic, and 47.2 per cent as idiopathic. The unclassified group is very large, amounting to 36.6 per cent. There are considerable variations in these classifications, however. Thus

for the year ended June 30, 1929, Craig Colony reported that of the 278 admissions, 43.2 per cent belonged to symptomatic, and 56.8 per cent to idiopathic groups. Of the 197 first admissions to the New Jersey State Village for Epileptics during the year ended June 30, 1930, only 4.6 per cent were classified as symptomatic, compared with 94.9 per cent classified as idiopathic. Evidently individual judgment in the matter of etiological factors plays an important part in classification of types of epilepsy.

TABLE 3. EPILEPTIC FIRST ADMISSIONS TO STATE INSTITUTIONS FOR FEEBLEMINDED AND EPILEPTICS IN THE UNITED STATES, 1926 AND 1927, CLASSIFIED ACCORDING TO TYPE OF EPILEPSY

| | Males | | Females | | Total | |
|---|---|---|---|---|---|---|
| | Number | Per cent | Number | Per cent | Number | Per cent |
| Symptomatic ..... | 396 | 17.8 | 238 | 14.1 | 634 | 16.2 |
| Idiopathic ..... | 1,005 | 45.2 | 836 | 49.7 | 1,841 | 47.2 |
| Unclassified ..... | 822 | 37.0 | 608 | 36.2 | 1,430 | 36.6 |
| Total ..... | 2,223 | 100.0 | 1,682 | 100.0 | 3,905 | 100.0 |

TABLE 4. PER CENT DISTRIBUTION OF EPILEPTIC FIRST ADMISSIONS TO STATE INSTITUTIONS FOR FEEBLEMINDED AND EPILEPTICS IN THE UNITED STATES DURING 1926, IN AGE GROUPS UNDER 20, CLASSIFIED BY SEX AND TYPE OF EPILEPSY

| Sex and type of epilepsy | All ages | Under 20 years of age | | | | |
|---|---|---|---|---|---|---|
| | | Total | Under 5 | 5-9 | 10-14 | 15-19 |
| Both sexes | | | | | | |
| Total ..... | 100.0 | 48.0 | 2.4 | 11.6 | 16.8 | 17.2 |
| Symptomatic ... | 100.0 | 56.9 | 2.5 | 17.9 | 17.9 | 18.6 |
| Idiopathic ..... | 100.0 | 46.9 | 2.7 | 10.5 | 16.1 | 17.6 |
| Unclassified .... | 100.0 | 47.3 | 2.0 | 10.6 | 17.9 | 16.8 |
| Male | | | | | | |
| Total ..... | 100.0 | 50.3 | 2.8 | 12.6 | 17.2 | 17.7 |
| Symptomatic ... | 100.0 | 56.9 | 3.3 | 19.4 | 20.4 | 13.8 |
| Idiopathic ..... | 100.0 | 49.7 | 3.3 | 10.8 | 15.0 | 20.6 |
| Unclassified .... | 100.0 | 47.6 | 2.2 | 11.1 | 18.0 | 16.3 |
| Female | | | | | | |
| Total ..... | 100.0 | 45.1 | 1.7 | 10.4 | 16.3 | 16.7 |
| Symptomatic ... | 100.0 | 45.1 | 0.7 | 12.0 | 10.6 | 21.8 |
| Idiopathic ..... | 100.0 | 44.0 | 2.1 | 10.2 | 17.2 | 14.5 |
| Unclassified .... | 100.0 | 46.8 | 1.7 | 9.9 | 17.8 | 17.4 |

In Table 4 the first admissions to state institutions in 1926 are classified so as to show the percentages in the several age groups under 20 years of age. Of the total epileptic first admissions to state institutions in 1926, 48.0 per cent were under 20 years of age; 2.4 per cent were under five years of age, 11.6 per cent were aged 5 to 9, 16.8 per cent were from 10 to 14 years of age, and 17.2 per cent were from 15 to 19 years of age. Of the symptomatic types, 56.9 per cent were under 20, compared with 46.9 per cent among the idiopathic types. The principal difference occurred in the age group 5 to 9 which included 17.9 per cent of the symptomatic types and 10.5 per cent of the idiopaths. These differences also occurred among the males, with the following additions. The symptomatic types exceeded the idiopaths at ages 10 to 14 with percentages of 20.4 and 15.0 respectively, but they were inferior in the age group 15 to 19 with 13.8 and 20.6 respectively. Among the females 45.1 per cent of the first admissions were under 20 years of age. Differences between the symptomatic and idiopathic groups occurred as follows: at ages 10 to 14, the latter exceeded the former with percentages of 17.2 and 10.6 respectively. At ages 15 to 19, the symptomatic types were in excess with a percentage of 21.8 as against 14.5.

TABLE 5. NUMBER OF FIRST ADMISSIONS OF EPILEPTICS TO STATE INSTITUTIONS FOR FEEBLEMINDED AND EPILEPTICS IN THE UNITED STATES IN 1926, PER 100,000 OF GENERAL POPULATION, IN AGE GROUPS UNDER 20, CLASSIFIED BY SEX AND TYPE OF EPILEPSY

| Sex and type of epilepsy | Under 20 years of age | | | | |
|---|---|---|---|---|---|
| | Total | Under 5 | 5-9 | 10-14 | 15-19 |
| Both sexes | | | | | |
| Total | 2.09 | 0.38 | 1.88 | 2.91 | 3.52 |
| Symptomatic | 0.41 | 0.06 | 0.48 | 0.51 | 0.62 |
| Idiopathic | 0.94 | 0.20 | 0.78 | 1.28 | 1.66 |
| Unclassified | 0.74 | 0.12 | 0.62 | 1.12 | 1.24 |
| Male | | | | | |
| Total | 2.41 | 0.51 | 2.23 | 3.27 | 4.05 |
| Symptomatic | 0.53 | 0.12 | 0.67 | 0.75 | 0.61 |
| Idiopathic | 1.01 | 0.25 | 0.81 | 1.21 | 2.00 |
| Unclassified | 0.87 | 0.14 | 0.75 | 1.31 | 1.44 |
| Female | | | | | |
| Total | 1.76 | 0.25 | 1.51 | 2.54 | 3.01 |
| Symptomatic | 0.29 | 0.02 | 0.28 | 0.27 | 0.64 |
| Idiopathic | 0.86 | 0.15 | 0.75 | 1.35 | 1.32 |
| Unclassified | 0.61 | 0.08 | 0.48 | 0.92 | 1.05 |

In Table 5 the epileptic first admissions in 1926, who were under 20 years of age, are reduced to rates per 100,000 population of similar age. It was shown in Table 2, that the rate of first admissions at all ages in 1926 was 1.7, with rates of 1.8 and 1.5 for males and females respectively. Epileptic first admissions under 20 years of age exceeded these with rates of 2.09, 2.41 and 1.76 respectively. The lowest rates occurred in the group under 5 years of age; the rates then increased regularly up to a maximum of 3.52 at ages 15 to 19. In this group the males and females had rates of 4.05 and 3.01 respectively. The idiopathic types of epilepsy have higher rates than the symptomatic, but it is questionable whether any significance can be attached to this, owing to the difficulties of uniform classification.

In Table 6 the data reported to the Sub-Committee on Problems of Mental Health in Childhood by five institutions for epileptics are combined to show the ages of patients under care at the end of the fiscal year in 1929. These institutions reported a total of 2,839 patients, of whom 1,534 were males and 1,305 females. In accordance with the official classification these were subdivided into 744 symptomatic and 2,037 idiopathic types. The remaining 58 were either unclassified or not epileptic. The totals are reduced to percentages in Table 7.

Of all the patients 23.6 per cent were under 20 years of age. The percentages in the exogenous toxaemic group are of little significance, owing to the small number of cases. In the remaining groups there is very little variation with respect to the percentages under 20 years of age. There are differences, however, in the constituent age groups. At 5 to 9 years, the endogenous, toxaemic type includes 1.6 per cent, those due to brain disease, 4.6 per cent, and the idiopaths, 2.3 per cent. At ages 10 to 14, the idiopaths include the largest percentage. At 15 to 19 years of age, the endogenous type has the largest percentage, followed by the idiopaths. We may also conclude that the males are younger than the females, since 25.9 per cent of the males and only 21.0 of the females are under 20 years of age.

TABLE 6. AGE OF PATIENTS UNDER CARE IN FIVE INSTITUTIONS AT END OF FISCAL YEAR IN 1929 CLASSIFIED BY EPILEPTIC GROUPS

| Age (years) | Total | | | Symptomatic | | | | | | | | | Idiopathic | | | Not epileptic and Unclassified | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Toxaemic | | | | | | Due to brain disease | | | | | | | | |
| | | | | Exogenous | | | Endogenous | | | | | | | | | | | |
| | M. | F. | T. | M. | F. | T. | M. | F. | T. | M. | F. | T. | M. | F. | T. | M. | F. | T. |
| Under 5 ..... | 6 | 2 | 8 | .. | .. | .. | .. | .. | .. | 4 | .. | 4 | 2 | 2 | 4 | .. | .. | .. |
| 5-9 ..... | 47 | 29 | 76 | 1 | .. | 1 | 1 | 1 | 2 | 15 | 10 | 25 | 29 | 18 | 47 | 1 | .. | 1 |
| 10-14 ..... | 137 | 91 | 228 | 1 | .. | 1 | 5 | 1 | 6 | 24 | 18 | 42 | 107 | 72 | 179 | .. | .. | .. |
| 15-9 ..... | 207 | 152 | 359 | 1 | .. | 1 | 14 | 7 | 21 | 27 | 29 | 56 | 164 | 110 | 274 | 1 | 6 | 7 |
| 20 and over... | 1,137 | 1,031 | 2,168 | 43 | 27 | 70 | 65 | 33 | 98 | 242 | 175 | 417 | 777 | 756 | 1,533 | 10 | 40 | 50 |
| Total ..... | 1,534 | 1,305 | 2,839 | 46 | 27 | 73 | 85 | 42 | 127 | 312 | 232 | 54 | 1,079 | 958 | 2,037 | 12 | 46 | 58 |

TABLE 7. PER CENT DISTRIBUTION OF PATIENTS UNDER CARE IN FIVE INSTITUTIONS AT END OF FISCAL YEAR IN 1929, BY AGE, CLASSIFIED BY EPILEPTIC GROUPS

| Age (years) | Total | | | Symptomatic | | | | | | | | | Idiopathic | | | Not epileptic and unclassified | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Toxaemic | | | | | | Due to brain disease | | | | | | | | |
| | | | | Exogenous | | | Endogenous | | | | | | | | | | | |
| | M. | F. | T. | M. | F. | T. | M. | F. | T. | M. | F. | T. | M. | F. | T. | M. | F. | T. |
| Under 5..... | 0.4 | 0.2 | 0.3 | .. | .. | .. | .. | .. | .. | 1.3 | .. | 0.7 | 0.2 | 0.2 | 0.2 | .. | .. | .. |
| 5-9 ..... | 3.1 | 2.2 | 2.7 | 2.2 | .. | 1.4 | 1.2 | 2.4 | 1.6 | 4.8 | 4.3 | 4.6 | 2.7 | 1.9 | 2.3 | 8.3 | .. | 1.7 |
| 10-14 ..... | 8.9 | 7.0 | 8.0 | 3.2 | .. | 1.4 | 5.9 | 2.4 | 4.7 | 7.7 | 7.8 | 7.7 | 9.9 | 7.5 | 8.8 | .. | .. | .. |
| 15-19 ..... | 13.5 | 11.6 | 12.6 | 2.2 | .. | 1.4 | 16.5 | 16.7 | 16.5 | 8.6 | 12.5 | 10.3 | 15.2 | 11.5 | 13.4 | 8.3 | 13.0 | 12.1 |
| 20 and over.. | 74.1 | 9.0 | 76.4 | 93.4 | 100.0 | 95.8 | 76.4 | 78.5 | 77.2 | 77.6 | 75.4 | 76.7 | 72.0 | 78.9 | 75.3 | 83.4 | 87.0 | 86.2 |
| Total ..... | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

## Conclusions

We may summarize our results as follows:

1. The number of epileptic first admissions, and the rate of first admissions, have increased since 1922. These increases are probably accounted for by increased institutional facilities.

2. Among first admissions, those under 20 years of age constitute 48.0 per cent of the entire group. The percentage increases regularly from the group under 5 years of age up to the group aged 15 to 19 years.

3. The rate of first admissions among those under 20 years of age is higher than that for all epileptics. The rate increases until a maximum in this group is reached in the age group 15 to 19 years.

4. In the resident population, those under 20 years of age constitute 23.6 per cent of the total population.

# THE RELATIONSHIP OF THE PSYCHIATRIST TO THE SCHOOL PHYSICIAN*

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H. L. Menken has caricatured psychiatry as the "weak sister" of medicine, and education, as "the master quackery of pedagogy."

As a representative of the specialty of psychiatry in a State education department, I hasten to get on safer ground than what Mr. Menken would have us believe. As an example of sounder reflection on these two noble and indispensable hand-maidens of progressive civilization, may I repeat that often quoted worthy dictum of Dr. Haven Emerson: "We have arrived at a point in the organization of our national effort for health where advances in the fields already pre-empted and liberally supported by public opinion and resources must wait for their entire success upon a fair beginning and progress in the most delicate and difficult and yet the most promising undertaking of all—the prevention of nervous disorders and mental defects."

Before entering on a discussion of relationships between the school physician and the psychiatrist, may I pass on to you an occasional comment which came within hearing range since taking up my duties in the New York State Education Department some six months ago.

One of our leading educators and administrators remarked that he could understand what is meant by "physical health," but "mental health" was beyond his comprehension. Another nationally known educator wished me to tell him what a psychiatrist could possibly contribute to the school system. Next, a school physician of many years' standing, remarked that the educator simply did not know what to do with a psychiatrist in their midst. Recently, a leader in that most promising field of vocational education, a man who daily faces the realities of practical life in directing our youth into channels of marketability, seriously reflected that the need and contribution of the psychiatrist in present-day

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education was of the greatest importance; somewhat wistfully, he added, "but do not fail us." Just before coming to Albany from Baltimore (where paradoxical logic prevails in that the health of all school children who are physically well is under the supervision of a physician, whereas as soon as a school child becomes abnormal or sick, physically or mentally, he comes under the direction of psychologist) a prominent educator was good enough to caution me that the real motive in seeking my help in a department of education was to take care of the therapeutic side of mental abnormalities since psychologists cannot legally practice (I rather inferred from him that it was not because they were not professionally equipped for this work).

I merely quote these statements to give you an inkling of some current ideas in educational circles—ideas which should be vital food for thought.

The fact that we are meeting here today in affiliation with the American Public Health Association attests our allegiance to the cause of preventive medicine in its multifarious ramifications. No less than 85 per cent of school physicians in New York State are also health officers, a happy combination of duties. The remaining 15 per cent are none the less guardians of the fortress of public health.

The most recent member to be admitted to the specialty of public health is the psychiatrist, particularly in his work of preventive psychiatry or mental hygiene. It is only some 15 years ago since psychiatry took on an active and aggressive preventive program, a movement the birth of which took place in a private residence in Connecticut in 1908.

Just as the war upon tuberculosis which began about 30 years ago has brought home laurels to a grateful public so is being aggressively waged a war from coast to coast, and indeed throughout the entire civilized world, on mental disease and defect, problems of behavior, personality difficulties, and maladjustments which cause inefficiency, unhappiness and social problems.

Since we are, in this instance, perhaps, dealing with a subtler and more ubiquitous enemy which wrecks his havoc over a long term period, extensive results of preventive therapy are not as yet, available in statistical form. Perhaps another 25 years will be

needed to bring to full fruition the excellent, but somewhat meager work at present being carried on in this most important aspect of public health.

May I bring a few statistics to your attention in order to confront you with the tremendous magnitude of the problems of preventive psychiatry? You are well acquainted with statistics in the field of physical abnormalities, such as those reported in this month's number of the Health Bulletin for Teachers, published by the School Health Bureau—Welfare Division of the Metropolitan Life Insurance Company—a concern whose wide and excellent distribution of free health literature deserves careful perusal by every physician, teacher and administrator. This number summarizes some common physical defects at the high school age: defects of teeth, 80 per cent; abnormal tonsils, 15 per cent; visual defects, 10 per cent; underweight, 10 per cent; postural defects, 5 per cent; defects of hearing, 3 per cent; heart disease and active clinical tuberculosis, each 1 per cent. The percentage in elementary school pupils would be somewhat higher in that many of these defects would be eliminated before reaching high school. Have we anything comparable to this in the sphere of mental defect and malfunctioning?

Dr. Bruce Robinson, director, Department of Child Guidance, Newark Public Schools, reports that 70 per cent of incorrigibles and truants are dull or feebleminded; that 15 per cent of school children are going through the experience of failure; that 20 to 30 per cent of the children in first grade are failing during the first grade experience; that not one of 45 boys, ranging from 10 to 16 years, in a disciplinary school, had not failed in first grade; that the majority of school failures are so because the school program is above or unsuited to the ability of the child, that educators for the most part have failed to recognize the close relationship between educational problems and failure, and *emotional* problems and failure. The chief reason for misfit children is a misfit curriculum.

One should realize that the perpetuation of the negative aspects of failure are responsible for far-reaching stresses and strains on school children many of whom are unable to adjust to it; that this results in a great variety of "physical" complaints. Moreover,

asocial developments in the form of truancy and various types of delinquency are often directly attributable to such unhealthy conditions. Should this not stir us to seek immediate redirection of educational methods and practice? Since most of us begin to squeal when our pocketbooks are hit let us examine briefly the cost of this experiment of failure—much of it being preventable.

The average cost per child for one year's education is $100 to $200 in public schools. The repetition of grades, one, two and three years, by children each year costs the taxpayers hundreds of thousands of dollars. It has been reckoned that the health examination per child may be kept down to 30 cents, while complete health service costs about $2.50 per child per year. A large amount is being expended on the older products of failure to adjust to life—the mentally sick who require hospital care and treatment. The economic loss from dementia præcox cases alone among first admissions in New York State during 1928 was over forty million dollars. Is it not appalling that common sense has not heretofore directed our interest, efforts and money to an active program of prevention which would save many millions of dollars which could be turned into constructive channels and alleviating economic distress such as we are now experiencing? The cost of health examinations and adequate personnel for effecting a far-reaching preventive program is relatively insignificant.

The annual admission rate of new cases to mental hospitals in the United States is about 90,000; in another ten years perhaps some 200,000 additional hospital beds will have to be found to take care of mental patients. Where are the future mental hospital candidates at present? Nowhere else but in our public and high schools. Out of our 24,000,000 school children it is estimated, at least, 4 per cent or 1,000,000 are destined to be blighted by mental disease unless mental hygiene is applied. One out of every 22 persons born will be a patient in a mental institution, if mental hygiene is not used to forestall the mental illness. In every seventh family in the United States there is an individual with mental illness. Some enthusiasts have stated that at least one-half of mental disease is preventable. This perhaps is an over-estimation. But even if we accept Dr. Adolf Meyer's modest ten per cent, think what a boon it would

prove to be—economically, socially and in the prevention of criminality, delinquency, dependency, inefficiency, unhappiness and misery. Mental hospitals in which the greatest majority of cases are late and fairly well developed, return about 25 per cent of all first admissions to society recovered, and another 15 per cent improved. These results probably compare favorably with the results of general hospitals.

The focus of our interest and efforts is shifting to mental health but not to the neglect of the concomitant and integrated physical welfare of our people. That this has been so long coming is difficult to appreciate when we consider that there are more persons sick in mental hospitals than in all other hospitals combined. It is probable that disorders of the mental functions outweigh in significance disabilities of all other organs of the body taken together.

Now what is our practical problem in terms of relationship between the school physician and psychiatrist?

The psychiatrist is first and foremost a physician and on this basis we stand on common ground with common interests and objectives. Our relationship must not be an "either or" but an "and." The question is not: "Is this a medical or a psychiatric problem" but "To what extent can we share in the responsibility of health and sickness problems of the *whole child* since we cannot separate mind from body? How may we prevent reduplication of effort and bring about the best utilization of our respective trainings and opportunities for active cooperative service? How may we obtain, maintain and insure medical leadership in all matters pertaining to the health of our school children?"

First, let us briefly review the outstanding objectives of the school physician. Since school health service began first in Boston, 1894; in Chicago, 1895; New York, 1897; Philadelphia, 1898; the scope and objectives have broadened. On August 1, 1913, through the subvention and foresight of Dr. Thomas E. Finegan, assistant commissioner for elementary education for New York State, a mandatory law on school medical inspection became active. The following purposes have since been embraced and more or less practiced:

1. To detect and exclude cases of parasitic and communicable diseases, and to prevent epidemics.

2. To detect physical defects and secure correction of same through cooperation of school officials, school nurses, parents, family physician, dispensaries, and welfare agencies.

3. To pass judgment on the physical fitness of teachers and various school employees.

4. To act as expert to the board of education in maintaining sanitary conditions and proper physical equipment in the schools.

5. To teach practical hygiene in the school and home through the agency of the school nurse and so-called health teachers.

6. To diagnose mental deficiency and exclude such cases that cannot profit from existing school facilities.

7. To make special studies of the relation of the physical child to various phases of educational activity, and to correlate preventive medicine and pedagogy in order to produce a maximum efficiency in the schools consistent with the preservation of health. This has resulted in the modification of curriculum to fit certain physical and mental types; modification of hours of study and recitation in relation to periods of relaxation, play and manual work; and better adaptation of teacher and pupil to their physical environment.

8. To cooperate with all agencies concerned with the social, moral, mental and physical improvement of the child.

9. To give each child at least an annual complete health examination by a physician to find out whether he is normal and, if not, what physical defects have to be corrected or modified for the attainment of maximal health and efficiency for that particular child.

The psychiatrist heartily concurs in all these objectives but would have you mindful to link up with physical each time it is used, the word, *mental*. Such a reminder is also given by the Committee on the Objectives of Education when it places as its first objective "the development of an understanding and evaluation of the self—body as well as mind." We embrace the conception of Effie F. Knowlton when she said: "The aim of the health examination is to discover the capacity of the individual for complete development and abundance of life—to determine the extent to which the individual is free to be well to the optimum, and to improve health to the individual's maximum."

Briefly stated the relationship of the psychiatrist to the school

physician can be summarized in two words, (1) *educational,* and (2) *clinical.* By far the more important of these is the educational aspect.

The need of clinical cooperation between the school physician and the psychiatrist may be exemplified by a study of 22 children 4 to 15 years old referred to the Henry Phipps Psychiatric Dispensary of the Johns Hopkins Hospital by physicians because of various complaints such as headaches, sick stomach, pains and aches, etc. Careful physical examination revealed no basis for the complaints. A social service investigation found in their homes adults with similar complaints, real or imaginary. All the children recovered with the removal of the home "infections" atmosphere.

In a high school of one of our large cities which I visited last year, on an average of 30 to 40 pupils were admitted to the school hospital on the basis of diffuse and vague pains and aches, visual and auditory disturbances, faintness, anxiety attacks, menstrual discomfort, etc. Here they were made comfortable in the hospital bed, given some aspirin or aromatic spirits of ammonia, or patted on the shoulder and told to forget about it. The school physician, a busy person with a private practice, had only time for a cursory examination or snap diagnosis, usually resulting in a placebo. The nurse in charge said that she got to know the ones really sick from the malingerers by eating with their teachers. Physical examination in these cases revealed no organic abnormalities. Most complaints were body protests to examinations or recitation stress, actual or anticipatory, unwholesome emotional atmosphere in the home, such as parental and sibling disharmony, fears, worries, disappointments, unsatisfied cravings, shocks, fatigue, expressed as substitutive, anxiety and escape reactions, or after effects of the night before.

An adequate examination, diagnosis and treatment of such cases is a lengthy affair requiring a multitude of facts, not only physical but scholastic, home, playground and social activities, psychological examination, and an investigation of the pupil's emotional life, cravings, longings, desires, thwartings, anticipations, successes and failures, and his attitude and feelings toward others as well as theirs to him.

As concerns the clinical relationship the work in the schools is

largely diagnostic and of a "steering" nature—a directing of the sick, mentally or physically, to proper sources of medical treatment at the first sign of illness. Wherever a pupil is encountered presenting complaints for which a thorough physical examination fails to reveal sufficient etiological relationship, such a pupil should have the benefit of a complete neuropsychiatric examination.

Although the school psychiatrist is vitally concerned in the physical health of the child, he reserves for himself those abnormalities of well being such as personality difficulties, behavior problems, situational maladjustment or mental malfunctioning, asocial tendencies, delinquency, truancy, problems of mental defect and retardation, the epileptic, the so-called "bad" or nervous child and the psychoneurotic pupil. Each of these complaint problems need examination and study before a diagnosis can be arrived at or treatment formulated.

The first requisite is a thorough physical examination. Here the school physician has an opportunity for close cooperation in the understanding, examination and treatment for varying degrees of mental malfunctioning. Since well trained psychiatrists are few their time must be conserved as much as possible in order to share his help with a large number of pupils. Thus he will depend on the school physician for most of the facts of the physical examination, although he should always give attention to the essentials of a neurological examination, conditions of the mouth and its contents, thyroid gland, or follow-up any suspicion of endocrinopathy or hematological disorder. In cases where a school physician is not available, the psychiatrist refers the pupil to his family physician, dispensary, or does his own physical examination.

The second requisite in dealing with a psychiatric problem is to have a complete report from the psychiatric social worker or visiting teaching concerning the various environmental factors—home, neighborhood, playground, part-time employer, social agency, etc.

Thirdly, the psychiatrist must have a psychological examination made involving tests of intelligence, educational achievement and performance ability. Where a psychologist's services are not available, the psychiatrist's training should be sufficient to do this part of the examination. Some psychiatrists prefer to do their own psychometric work.

Finally, a thorough neuropsychiatric examination must be made, paying particular attention to the emotional status, content of thought, attitude and feeling toward self and others, interests, longings, desires and anticipations, insight, judgment, details of family history and setting, habit training, personality and developmental history, social life, economic factors, etc. It is the psychiatrist's business to summarize and evaluate the findings of the other examiners in order that he might formulate ways of treatment or further lines of investigation. This is a multifariously involved problem since it invariably requires the understanding and sympathetic cooperation of a number of people—school and family physician, nurse, home, playground leader, physical educator, part-time employer, and often a social agency.

The psychiatrist never intended, nor is it a physical possibility in view of his relative scarcity, to treat the bulk of so-called nervous and mentally malfunctioning pupils or patients in general. Therefore, he must obligate himself to instruct the school physician, nurse, and classroom teachers to recognize and assist in treating and readjusting these cases. I know of no better way of gaining such knowledge and experience in applying it than regularly attending or assisting in child guidance clinics, neuropsychiatric clinics and other places where psychiatrists function, such as the juvenile court and some pediatric clinics. Keeping abreast of the times with the rapidly increasing advances in educational hygiene, mental as well as physical, and reading authoritive literature such as Dr. Thom's book on "Everyday Problems of the Everyday Child," "Suggestions of Modern Science concerning Education," by Jennings, Watson, Meyer and Thomas, and a considerable body of free literature distributed by the National Committee for Mental Hygiene, New York State Charities Aid, New York State Department of Mental Hygiene, and the Commonwealth Fund Division of Publications; and in Canada the Canadian National Committee for Mental Hygiene and their excellent publication "Mental Health"—all this, as well as attending lectures, clinics and conferences on such problems will be of considerable help. If such a responsibility is shouldered there will be fewer nervous invalids created because the average medical man fails to investigate mind as well as body, and fewer chronic invalids making the rounds of doc-

tors' offices the country over. Is it any wonder that the country is teaming with charlatans, quacks, chiropractors, naturopaths, psychic healers and many other irregular practitioners of the same ilk?

It is the psychiatrist's desire to cooperate with medical men, general practitioner as well as specialist, in gaining a better understanding of the nature of human complaints in their relation to the *total individual.* This of course takes time, but time well spent. Many of these cases can be handled with considerable success by the general practitioner if he will but take time to inform himself in such matters and be willing to give more time to the study of the personality development, habit patterns and emotional life of his patients. If it is true that 40 to 60 per cent of patients going to doctors' offices are ailing and incapacitated solely by virture of poor habits of mental hygiene, surely we ought to make it a prime interest to give these unfortunate sick persons the same study and care as we would a case of pernicious anemia, Basedow's disease, pyelitis or what not. Remember that if the medical profession fails to do so, the quack is always at hand with his gilded "sure cures" and promises of anything and everything as long as one's money lasts.

Just here, let me sound a note of warning. Although preventive psychiatry is an essential and integral part of any school or public health program, this does not pre-emptorily give the health officer or medical school inspector leadership in such matters unless he has also had several years of training and practical experience in this most intricate, complex, and multifariously involved specialty. Nowhere in medicine is a more thorough grasp and working knowledge of all the other departments of medicine needed than in the successful practice of neuropsychiatry. He must be prepared to determine opportunities for treatment and adjustment at whatever level of integration a disorder can be controlled. He cannot properly be merely a psychotherapist, but has to be primarily physician in command of all the medical training, and also reasonably informed in sociology or the technically manageable aspects of human situations and group functionings.

The psychiatrist in the schools must therefore be given a free hand to shape his own policies and define his own specific responsibilities and means of contribution. He shares the common-sense

practice and criticism wherever common-sense data are given an exaggerated professional nimbus. One of his problems is to shape ways and means to formulate the medically obtained data so that the educationally useful matters can stand out in the most helpful manner.

The school physician and public health officer on the other hand must realize their limitations in the handling of the mentally maladjusted. He must appreciate the danger of treating such patients symptomatically since this does absolute harm in fixing the symptoms in a vicious circle of chronic invalidism. The more involved behavior and personality problems, mental defects and psychoneuroses are primarily psychiatric problems, although the practitioner should be able to early recognize such cases and make a tentative diagnosis and help them obtain suitable treatment promptly. Such cases should not be tinkered with even though a diagnosis has been made since they often require all that the most skillful psychiatrist can give them. In such cases the practitioner can help the psychiatrist evaluate the concomitant and integrated physical condition and share in its treatment, but the major diagnostic and therapeutic burden rests on the psychiatrist. Let us hope that school physicians and public health officers will not continue perpetuating the assumption of treating such cases, as in one instance that recently came to my attention when a school medical inspector attempted to give advice to the father concerning a knotty behavior problem of his son and this without a thorough physical examination, not to mention a prerequisite psychiatric, psychological and neurological examination. Most enlightened people now realize that child guidance problems are primarily parental guidance problems. Nor should one toy with such cases, submit them to all sorts of tests, examinations, treatments and expense and even ill-deserved contempt before the physician reluctantly calls in the specialist in such matters. As one medical school inspector said, "I'd like you to get the 'low down' on this case, everybody else has had a shot at it." We would have the medical man appreciate that every behavior problem has a definite cause, that problem children function in more or less typical ways, and that a diagnosis should and usually can be made, if only sufficient time and study be given.

We have all, in our more sober moments, regretted the passing

of the traditional family physician. We are today an over-specialized, somewhat astigmatic profession. There is now, just the same or more so than 50 years ago, the need and desirability of a family advisor. Dr. Austin Riggs well says: "Since the neuropsychiatrist by the very nature of his field must know all that can be gleaned of the patient's family history, direct and collateral lines, his familial, social and financial conditions, as well as a full medical history, it seems logical to assume that he is the one best fitted to be the family advisor. He is often best fitted to correlate the mass of data from the other specialties concerning a patient and steer him and the family because he has had to assume control in order to guide the patient or the whole family out of the labyrinth of unrelated and uncoordinated specialties."

And so, it would appear that until school medical inspectors and public health officers become more psychiatrically intelligent and specially trained in this most important specialty, which is also as *general* in its scope as anyone could imagine, leadership during the next 10 or 15 years will increasingly become the onus of the well trained neuropsychiatrist. The day of home made psychology and "home brew" psychiatry and mere common sense without critical training is rapidly vanishing.

It should go without saying that leadership in health service whether it be in the school medical inspection bureau or any other sphere of preventive medicine, must always remain under the guidance of the physician. It is he who holds the key to all that has proven sound in health matters throughout the ages; by training and practical experience he is the logical choice in this leadership. But the mere fact of an M. D. degree after one's name has not, in every instance, assured control of the ship of health. Again the fault lies more with ourselves than with the educator. Especially in a State education department or school system we must maintain the highest level of performance, service, scholarship and research in order to win the approval of the educator for such leadership. This requires the best that can be found in trained personnel and objectives which seek not to give the people of the State merely what they want, but to wage an aggressive campaign of health service in keeping abreast with the latest advances in medical science and educational hygiene. Real education has no place for the pus-

sillanimous politician. Real service is based on knowledge and the ability to translate this into progressive practical service. Mere lip-service, like cupboard love, without concrete performance shown in results and the winning of a consensus of opinion of one's best judges and friends, should have no place in educational health service.

Similarly in the subdivision of health teaching, leadership should be in the hands of the medically trained and experienced physician or nurse who have also had professional pedagogical training and experience. This is the only safe course to assure a common-sense balance of theory and practice and proper respect for medical leadership in all health matters.

If such standards of qualification for health teaching is maintained, instances such as occurred this year to a certain supervisor who returned from lecturing in a summer school for teachers will be avoided. This particular health teaching supervisor was disappointed in the amount of usefulness of her services because at least 75 per cent of the questions asked were "medical" such as our school nurses daily encounter in practice. Health teaching functions best under the direction of the school physician or medical inspector, and not the physical educator. On the other hand, physical education should be looked upon primarily as an aspect of health service and health education and as such should be placed under the school physician or medical inspection bureau. Similarly special classes for the visual, auditory and speech defectives, open air, cardiac and cripple classes should be under the surveilance of the school physician who also would profit by some professional pedagogical training and experience.

I have attempted to sketch for you the chief points of contact and relationships of the psychiatrist to the school physician. We have seen that this is essentially clinical and educational. The latter is by far the more important since physicians in general should be helped in treating the bulk of these cases. Although no sharp line of demarcation can be made between the medical specialties, more or less delimitations of mutual functionings is discussed. The *sharing* of responsibility is our chief consideration.

In conclusion, let me urge you to be patient, constructively critical and above all keep an open mind on the evaluation of the rela-

tionship of the psychiatrist and what he has to offer to the school physician. Surely there is work and glory enough for all if we will but obligate ourselves to bring to the front an inquiring attitude and an active, wholesome spirit of cooperation. Should your expectations be not fulfilled I would remind you of the words Shakespeare put into the mouth of Cassius, "The fault, dear Brutus, lies not with the stars, but with ourselves, that we are the underlings."

# LEAD POISONING

## (*A Histopathological Study of the Nervous System of Cats and Monkeys in the Acute and Subacute Stages*)

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### PART I*

According to Catalano,[1] experimental investigation on lead poisoning was first initiated by Mischerlich in 1836. In spite, however, of the numerous cases of chronic lead poisoning involving the nervous system, there is still, from the pathological standpoint, much doubt concerning the site of the primary lesion. As a result, several theories have been brought forth by which lead is thought to act primarily on one or more of the following structures:

1. The vascular system.
2. The muscular system.
3. The peripheral system.
4. The central nervous system.

The data registered by the various authors may be briefly summarized as follows:

### I. HUMAN PATHOLOGY

A. *The vascular system:*—For Hitzig[2] (1868), lead acts directly on the walls of the blood vessels producing an inflammatory lesion leading to their rupture and subsequent interference with the blood supply to both nerves and muscles. The same inflammatory lesions are registered by Braillon and Bax[3] (1912) as the essential lesion in chronic lead poisoning.

Oeller[4] (1883) believed in a degeneration of the blood vessel walls as the cause of hemorrhages found in lead poisoning and Robinson[5] (1885) also emphasized the marked hyaline degeneration of the blood vessels in both white and gray substance of the cord and nerve sheaths. Boerwinkel[6] (1890) and Eichhorst[7] (1890) also regarded the initial disease as one related to the circulation. Siefert[8] (1870) and later on Mott[9] (1909) described also degenerative changes in the blood vessels as the cause of the minor multiple hemorrhages either in the brain or in the spinal cord.

* This article will be concluded in THE PSYCHIATRIC QUARTERLY for April, 1932.

Heubel[10] (1871) and Rosenstein[11] found that in dogs poisoned with lead definite cerebral anemia was produced due to vasoconstriction, and considered it to be due to the direct action of lead upon the intima of the blood vessel walls.

For Charlier[12] also (1882) the principal factor in the production of lead encephalopathy was an anemia of the nerve centers, whereas, Elschnig[13] (1898) believed that the action of lead is in the nature of a definite motor spasm of the blood vessels due to the action of lead directly upon the unstriped muscular fiber of the vessel walls. Vasomotor disturbances of the brain itself may also enter into action.

B. *The muscular system*: Tiburtius[14] (1876) described degenerative changes in the muscles, and Friedlander[15] (1879) expressed the opinion that the deposit of lead in the muscles themselves produces first a degenerative myositis, a process which later on invades the trunk of the peripheral nerves and finally reaches the anterior root, a view which is also favored by Kast[16] (1880).

For Zunker[17] (1880) both peripheral nerves and muscular system are simultaneously but independently involved, while for Aub, Fairhall, Minot, Reznikoff[18] (1926), it seems probable that the physiological lesion of lead palsy is primarily in the muscle.

C. *Peripheral nervous system*: (Peripheral nerves and anterior horn cells). Tanquerel des Planches[19] (1839), who collected over 2,151 cases of lead poisoning, never observed gross changes in the spinal cord. The paralysis which he pointed out in 107 cases was attributed by him to some form of motor neuritis.

Lancereaux[20] (1862) and Westphal[21] (1874) described cases of chronic lead poisoning in which atrophic changes in the branches of the radial nerve were found but no changes in the nerve roots or in the spinal cord. Charcot[22] (1877) expressed also the view that in lead poisoning the lesions were primarily neuritic in type.

Moritz[23] and Eisenlohr[24] (1880) favored also the view that the nerve changes are primary, a view which later on was advocated by Anglada (1911). For Duplaix[25] (1883), Schultze[26] (1885), and Eichhorst (1890) the lesions are primary in the peripheral nerve fibers and muscular tissue. Leyden[27] (1887) believed lead palsy due to a toxic neuritis.

For Fisher[28] (1892) lead acted on the entire nervous system sim-

ultaneously, as he described in his case lesions of the anterior roots, of the cells of the anterior horn, of the columns of Gall, and Lissauer's tract. For Goldflam[29] (1893) the lesions are primary in the peripheral nerves and muscular tissue. Ceni[30] (1897) believed that in lead poisoning the lesions of the peripheral nerves and of the muscles are independent of the lesions of the spinal cord nerve cells, considering the fact that the lesions of the peripheral structures were far more pronounced than the lesions of the nerve cells. Boveri[31] (1913) emphasized the predilection of lead for the meninges and peripheral nerves and in 1927 Buzzard and Greenfield[32] pointed to the stronger involvement of the peripheral nerves as compared with the involvement of the roots.

While the previous authors, to whom Dejerine[33] (1879) might be added, considered the lesions in the root or peripheral nerves as primary or dominant, Erb[34] (1874), Remak[35] (1876), Bernhardt[36] (1878), and Vulpian[37] (1879) believed the lesion to be primarily in the nerve cells of the anterior horn. Oppenheim[38] (1885) and Beatty[39] (1886) found the most marked alterations in the cervical and lumbar enlargements of the spinal cord, where the cells of the anterior horn were considerably involved. In Monakow's[40] case (1880) involvement of the cells of the cervical region was noticeable in connection with degeneration in the radial nerve. Besides, the nuclei of the 5th, 8th, 9th, 10th, 11th and 12th nerves showed considerable atrophy. Brisdall[41] (1882) favored also the spinal origin of lead paralysis in the sense that impairment of function in the spinal centers is more liable to affect the nutrition of centrifugal nerves and organs than the latter are to react upon the former.

In 1890 Sorgo[42] described a case of progressive spinal muscular atrophy traced to lead, in which degeneration of the spinal cord was a marked feature. For Spiller[43] (1903) it seems almost impossible to determine whether lead involves primarily the motor fibers or the motor cell bodies of the spinal cord as both peripheral nerve fibers and motor cell bodies are sooner or later affected. Based on their review of numerous papers dealing with the pathological findings in lead poisoning, Hyslop and Kraus[44] (1923) concluded that the so-called multiple neuritis of lead poisoning consists in a primary involvement of the ganglion cells and consequently should be regarded as a true neuronitis.

D. *Central nervous system*: Cadwalader's[45] case (1912) of chronic lead poisoning disclosed besides a reduction in the number of the anterior horn cells, a marked degeneration of nerve fibers in the lateral columns. In another case the same author described vascular changes in the paracentral lobules and degenerative changes of the large Betz cells. Changes of vascular and glial nature in the brain and cerebellum were subsequently described in 1921 by Hassin.[46] Fatty infiltration of the nerve cells was not infrequently met with, and Purkinje cells showed vacuolization, while inflammatory elements were present in the pia membrane. In 1925 Martin Saint-Laurent[47] also reported two cases of lead poisoning in which the nerve cells of the cerebral cortex appeared filled with chromophilic granules.

The presence of lead in the cerebrum and its elective localization in the gray substance is, according to Meillere,[48] (1903) a constant feature in lead poisoning. This investigator states that an appreciable amount of lead may be found normally in the organs of an individual who has never been exposed to absorption of lead (''normal lead''), and that the amount of lead found in these individuals is not much smaller than the amount found in patients suffering from a mild lead intoxication. In contrast to Meillere's findings, Spiller could not detect the presence of lead in the brain after a careful examination of the organs.

## II. EXPERIMENTAL PATHOLOGY

A. *Vascular system*: Goadby and Goodbody[49] (1909) in a careful study of cats submitted to inhalation of lead, concluded that the primary effect of lead is to cause microscopical hemorrhages affecting practically all the tissues of the body. Including the central and peripheral nervous systems. In 1912 Goadby, in collaboration with Legge,[50] reiterates in experimental pathology that no degeneration or alteration in the spinal cord was found sufficiently gross to account for the paralysis, whereas, the amount of pressure produced by the yielding of the vessel walls on the nerve bundles and the associated exudation was evidently sufficient to cause compression and thereby loss of function on the nerve in question.

Bonfiglio[51] (1909) found in three dogs in the deep layers of the cerebral cortex active proliferation of the endothelium of the blood

vessels, leading to an enormous thickening of their walls and to the formation of new blood vessels. This endarteritis affecting the smaller blood vessels of the cortex did not differ from the one seen in brain lues and in encephalitis hemorrhagica superior.

B. *Muscular system*: Gusserow[52] (1861) was probably the first to obtain evidence suggesting the possibility of lead acting directly upon the muscle fibers, a fact confirmed in frogs, rabbits, and dogs by Harnack (1878), in frogs by Cash[53] (1908), and in frogs and cats by Reznikoff and Aub (1927).

C. *Peripheral nervous system*: (Peripheral nerves and cells of origin)—Gombault[54] (1880) was the first to describe the appearance of a segmental periaxial neuritis in guinea pigs being fed with white lead for a period of over six months. Microscopic examination of the peripheral nerves showed in the same nerve fiber presence of interrupted lesions affecting some interanular segments with the exclusion of others. As a rule only the myelin sheath and the protoplasm of the cells of Schwann were affected and more rarely the axis cylinders. Although he found that the anterior horn cells of the spinal cord contained numerous vacuoles, Gombault believed that his "periaxial neuritis" did not depend on any modification of activity of the trophic centers in the spinal cord. Gombault's findings were confirmed in 1889 by Prevost and Binet[55] in cats, dogs, rabbits, and guinea pigs where they produced what they describe as a lead polyneuritis with primary affection of the motor nerves.

Nissl[56] (1892) kept several rabbits in a box where white lead dust could be continually asborbed by the animals and reported definite changes in the anterior horn cells. Stieglitz,[57] in the same year, found focal inflammatory lesions in one of the anterior horns accompanied by degeneration of the ganglion cells, consisting mainly in diffuse vacuoclization. The peripheral nerves in these cases were intact. Schaffer[58] also (1894) reported lesions involving the nerve cells of the spinal cord.

Lugaro[59] (1897) described the lesions of the nervous elements in four dogs which received hypodermic injections of 5 per cent solution of neutral lead acetate. One of these animals was killed on the 63rd day, another after 37 days, and a third after 31 days, while the fourth was allowed to recuperate and to live for eight months.

In the first two cases the cells of the spinal ganglia showed an early and marked disintegration of the chromatin substance. He found similar changes in the cells of the spinal cord, Purkinje elements, and ganglion cells of the cortex. For Lugaro the character of the lesions varied according to the severity of the poisoning and no recognizable lesions could be detected in the nerve elements of the dog which was allowed to recuperate.

Catalano (1906) in chronic experimental lead poisoning in dogs and rabbits, reported also definite cellular changes in the anterior horn cells of all spinal segments. An increase in the number of neuroglia nuclei was evident especially surrounding the central canal. The nerve cells of the spinal ganglia showed mild alterations. In the vicinity of the spinal ganglia the nerve roots showed marked swelling of the axis cylinders.

Battistessa[60] (1911) found modification of the Golgi internal reticular apparatus of the nerve cells of the spinal ganglia in rabbits following hypodermic injections of neutral lead acetate in association with oral administration of the metal. Lesions of the same apparatus have been described in dogs by La Torre[61] (1924) as consisting first of a hypertrophic reaction, followed by a secondary regressive or atrophic phase, leading either to fragmentation of the reticulum or to vacuolization of the cytoplasm. Lesions of the anterior horn cells are also recorded by Spielmeyer[62] (1922), and in Lehmann, Spatz and Wisbaum-Neuburger's[63] cases (1926) the anterior horn cells of the cord presented a honey-combed appearance, the cell body being vacuolated and indistinctly outlined, and often reaching a stage of complete liquefaction.

Chemical experiments performed by Heubel[64] (1871) showed that the bones and the spinal cord retain a large amount of lead after absorption and that the muscular system and the blood retain the least amount of the toxic substance. This fact, according to Heubel, is more in favor of the central origin of the symptoms of lead poisoning.

Experiments to investigate the action of lead on the isolated muscle and nerve preparations were first initiated by Dozzi[65] in 1912. According to this investigator, lead undergoes a chemical combination with the nerve substance by virture of which motor nerves suffer a marked and progressive diminution and ultimate

disappearance of their excitability. Because of the strength of the solution used by Dozzi (27 mg. of lead acetate per c.c.), Resnikoff and Aub[66] do not consider his findings as significant. The latter investigators repeated Dozzi's experiments on muscle-nerve preparations obtained from frogs. The nerves of these preparations were treated with Ringer's solution containing lead chloride in various concentrations (0.05, 0.10, 0.23, and 0.46 mg. per c.c.). They found that the conductivity of the nerves thus treated, as judged by the response of the muscle to electrical stimulation, was not impaired since the response of these muscles was exactly the same as that of the control preparations.

D. *Central nervous system*: Kussmaul and Maier[67] (1872) described the presence of areas of sclerosis in the brain cortex where a slight degree of periarteritis was also found especially surrounding the small arteries.

For Popow[68] (1883) arsenic, lead, and mercury cause an acute poisoning, a change sharply resembling the ones of a central myelitis. In subacute cases, the pathological process involves not only the gray but also the white matter of the cord. The peripheral nervous system remains unaffected.

In Catalano's cases the alterations in the cerebrum were generally mild and consisted essentially of slight hyperemia accompanied at times by minute punctiform hemorrhages both in the white and in the gray substance, some chromatolysis of the nerve cells, and an increase of neuroglia.

Lehmann, Spatz and Wisbaum-Neuburger described the presence in cats of large fat deposits in the ganglion and endothelial cells of the brain cortex and in the anterior and posterior horn cells of the spinal cord. Typical ameboid glia cells could be seen in some cases, while pyknosis and other evidences of regressive changes in the glia elements were common. At times, the fibrillar structure of the ganglion cells was completely lost. According to these investigators, the pathological changes occurring in lead poisoning may be divided into three groups: (1) inflammatory changes; (2) fatty degenerative changes, and (3) regressive changes of the nerve cells. Neither endarteritis of the smaller blood vessels of the brain (as described by Bonfiglio) nor changes in the peripheral nerve fibers were found by Lehmann and his associates.

According to De Villaverde[69] (1928) lead produces in the brain modifications of the chemical composition of the microglia which probably accounts for the frequent failure in obtaining a good impregation of these elements with the specific method of Del Rio Hortega. The first morphological change in the microglia consists in the appearance of rounded areas in the cell protoplasm which must not, however, be considered as vacuoles which only occur in the more advanced stages of intoxication. For Bolsi[70] (1929) the phenomena of hypertrophy and proliferation predominate over those of degeneration, especially in the oligodendroglia. When degenerative changes occur, the perinuclear protoplasm increases in volume and loses, to a great extent, its affinity for silver. Vizioli[71] has recently (1929) brought forth additional evidence of involvement of the micro and oligodendroglia in the brain of lead-poisoned rabbits. This investigator reports a process of acute swelling in the oligodendroglia as described by Penfield and Cone. The microglia, on the other hand, presents in a more advanced stage of the toxic process, an initial state of progressive changes which also is soon followed by definite degenerative and regressive phenomena (acute swelling and clasmatodendrosis).

Roberti[72] (1911) described in rabbits besides acute degenerative changes of the nerve cells of the brain, a severe involvement of the astrocytes leading to clasmatodendrosis. The author believes that lead has an elective action on the astrocytes.

* * *

From the experimental point of view lead poisoning has been produced in various manners. Prevost and Binet did it by introducing the metal under the skin and into the peritoneum. La Torre deposited the lead salt into the rectum by means of a rectal tube and Straub[73] (1911) introduced it directly into the intestines. The same authors, to whom we may add Scremin[74] (1925), have also injected the poison directly into the venous stream, while subcutaneous injections of lead salts have been used by Prevost and Binet, Lugaro, Battistessa, La Torre, Vizioli, and others. Most experimenters, however, following Curci's[75] suggested (1884) that absorption takes place more easily by way of the gastro-enteric tract, gave lead to the animals with their food, (Curci, Prevost and Binet. Catalano, La Torre, Scremin, Combemale and Francois,[76] Lehmann,

Spatz, Neuburger, etc.). Curci contends that in the gastro-enteric tract lead is transformed either into an albuminate or a chloride and absorbed as such and then taken up by the red blood cells from where it is deposited as an albuminate in the various organs of the body. In connection with Curci's view we must keep in mind the fact that Aub, Minet, and others[77] (1924), believe that lead is carried chiefly in the blood plasma as a tertiary phosphate to be stored especially in the calcareous portion of the bones.

The respiratory tract has also been used for the introduction of lead into the animal organism and Stieglitz (1892) used intratracheal pulverizations of a solution of lead acetate in rabbits and guinea pigs in harmony with Nissl's view (1892) that the lungs absorb the poison more readily than the stomach or intestines. Goadby and Legge (1912) in experimental inhalation reached the important conclusion that lead dust circulating in the air is many times more dangerous than lead actually swallowed, considering that not the whole of the lead contained in the inhaled air reached the lung. The authors feel that the rates of poisoning via the lung to poisoning via the intestinal canal is as 100 to 1. Another important result of their experiment is that the addition of alcohol to the animal's diet undoubtedly hastened and determined the appearance of lead poisoning.

Experimental pathology points also to the fact that some animals show more susceptibility to the poison than others. Combemale and Francois (1890) gave 0.01 to 0.05 grams of lead chloride daily with the food to six dogs all of which began to show symptoms of poisoning at the end of about a month. According to these investigators, dogs are especially susceptible to the effects of lead.

Lehmann and his associates noticed that the most outstanding symptom in 8 out of 9 cats treated with lead carbonate was the appearance of convulsions, while none of the rabbits used by Stieglitz in his experiment on intratracheal pulverizations developed such a symptom. In our whole series of experiments we were able to report convulsions in only one case. The animals, however, were not always under our direct observation.

## Experimental Data

We have limited our investigation to the study of the acute and subacute stages of lead poisoning since we had in mind to establish

the seat of the primary lesions resulting from lead poisoning. We have investigated a large series of animals, 15 of which are being reported (13 cats and 2 monkeys). These were fed or subjected to intravenous injections of adequate salts of lead, and died during intervals of from 24 hours to 78 days. Table 1 summarizes the number of injections and the amount of lead administered to each animal.

Both the cats and monkeys soon began to show marked gastric disturbances (vomiting, diarrhea, anorexia, emaciation, general weakness, etc.). Because of their complete loss of appetite and to avoid starvation, stomach-tube feeding had to be resorted to in many cases.

Autopsy was performed on the animals soon after their death. Specimens of one-half of the brain from the frontal, temporal, parietal, and occipital regions, of the basal ganglia, cerebellum, pons, cervical, thoracic, and lumbar cord were fixed in formol bromide, whereas, the remainder of this half of the brain was fixed in formalin. The other half was fixed in alcohol and stained in serial sections with the Nissl stain. The brachial plexus and sciatic nerve, the biceps and quadriceps were also studied for degenerative changes.

*Cat No.* 1.—Animal survived 78 days. Lead carbonate was administered by mouth in daily doses of 0.74 grams associated with food.

TABLE 1. RECORD OF EXPERIMENTS IN LEAD POISONING

| Animal | Way of introduction | Total amount given | Loss of weight | First clinical symptoms | Death |
|---|---|---|---|---|---|
| Cat 1. | 0.74 gm. lead carbonate ($PbCO_3$) daily by mouth* | 57.70 gm. | 26%** | On the 42nd day | Died on the 78th day |
| Cat 2. | 0.71 gm. lead carbonate daily by mouth | 44.02 gm. | 13% | On the 11th day | Died on the 62nd day |
| Cat 3. | 0.84 gm. lead carbonate daily by mouth | 48.72 gm. | 21% | On the 34th day | Died on the 58th day |
| Cat 13. | 1.5 c.c. of 1 % lead acetate solution intravenously every 5th day; 1.5 gm. lead carbonate in the food daily between the injections | 9.090 gm. | 9% | On the 8th day | Died on the 33rd day |

TABLE 1. RECORD OF EXPERIMENTS IN LEAD POISONING—(Concluded)

| Animal | Way of introduction | Total amount given | Loss of weight | First clinical symptoms | Death |
|---|---|---|---|---|---|
| Cat 12. | 1.5 c.c. of 1% lead acetate solution intravenously every 5th day; 1.5 gm. lead carbonate in the food daily between the injections. | 16.57 gm. | 11% | On the 12th day | Died on the 21st day |
| Cat 7. | 2 c.c. of 1% lead acetate solution daily, intravenously | 0.22 gm. | 3% | On the 5th day | Died on the 11th day |
| Cat 11. | 2 c.c. of 1% lead acetate solution daily, intravenously | 0.20 gm. | 4% | On the 5th day | Killed on the 10th day |
| Cat 10. | 2 c.c. of 1% lead acetate solution daily, intravenously | 0.16 gm. | 6% | On the 6th day | Died on the 8th day |
| Cat 9. | 3 c.c. of 1% lead acetate solution daily, intravenously | 0.15 gm. | 2% | On the 3rd day | Killed with ether on the 5th day |
| Cat 6. | 10 c.c. of 1% lead acetate solution daily, intravenously | 0.40 gm. | | On the 2nd day | Died on the 4th day |
| Cat 5. | 20 c.c. of 1% lead acetate solution daily, intravenously | 0.60 gm. | 2% | On the 2nd day | Died on the 3rd day |
| Cat 8. | 5 c.c. of 1% lead acetate solution daily, intravenously | 0.15 gm. | | On the 2nd day | Killed on the 3rd day |
| Cat 14. | 10 c.c. of 1% lead acetate solution | 0.10 gm. | | | Killed on the 2nd day |
| Monkey 1. | 1.03 gm. lead carbonate daily by mouth | 67.98 gm. | 8 % | On the 12th day | Died on the 66th day |
| Monkey 2. | 1.07 gm. lead carbonate daily by mouth | 65.27 | 12% | On the 16th day | Died on the 66th day |

* The quantities given in this colum refer to average doses.

** Obtained from comparison of the initial weight and the weight at the time of death of the animal.

## Histological Study

*Frontal Region*—Both large and small nerve cells are severely involved. The lesion involves practically all the layers (Fig. 1), although it seems to be more severe in the external ones. At high power the lesions are seen to consist mainly in swelling of the nerve cells, disintegration of their cytoplasm, formation of vacuoles, and gradual liquefaction of the whole element (Fig. 2). The process of disintegration seems to be more pronounced around the nucleus which sometimes appears shrunken with a large deeply stained nucleolus. Other cells appear swollen with prolongments somewhat more visible and within the cytoplasm there is presence of numerous ring-like formations. Finally, other elements disclose swelling of both cytoplasm and nucleus which, in this case, is not deeply stained but swollen and granular (Fig. 3). The type of lesion often corresponds to the so-called severe type of disease of the nerve cells as described by Nissl. Here and there, however, groups of cells are seen showing changes more comparable to the so-called ischemic type of cells as described by Spielmeyer. In this case the nerve cells appear altogether shrunken, the Nissl bodies absent, the nucleus deformed and deeply stained. No vacuoles are seen in the cytoplasm. There are, however, all the stages of transition between this apparently ischemic type of lesion and the severe type of liquefaction as above described.

The involvement of the astrocytes is most evident in the gray matter and consists mostly of degenerative changes represented by swollen elements, the cytoplasm of which is vacuolated and the processes of which are irregular and deformed undergoing a more or less advanced stage of clasmatodendrosis (Fig. 4). The degenerative changes of the astrocytes seem to involve not only the normal elements, but also elements which have previously undergone progressive changes. Therefore, hypertrophic cells are seen disclosing degenerative changes of both cytoplasm and prolongments (Fig. 5). Some of the astrocytes have morphologically an ameboid-like appearance. The changes are especially pronounced at the boundary between the cortex and the white substance.

Contrasting with the severe involvement of the astrocytes in the gray matter, the astrocytes of the white matter are well preserved and even show progressive changes. They disclose hypertrophy

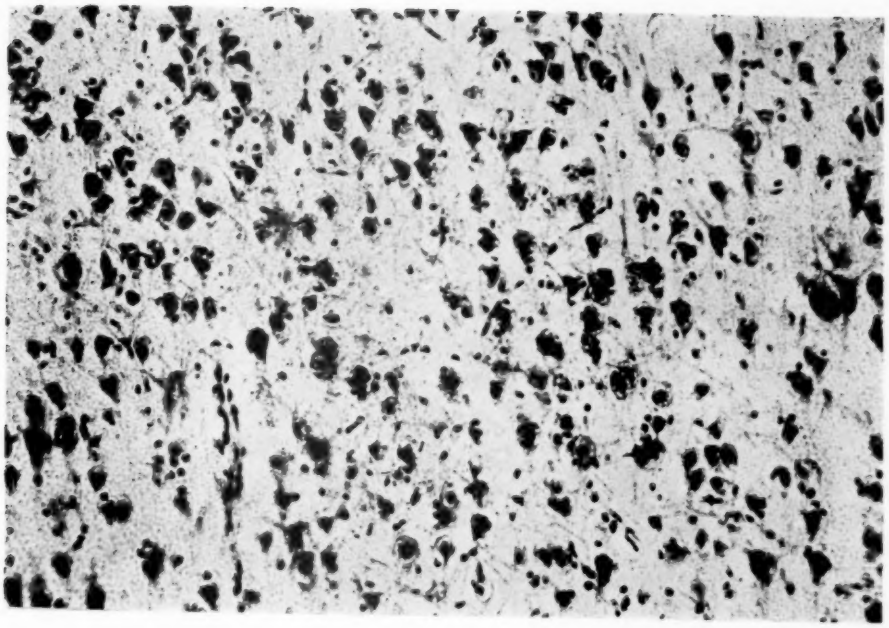

Fig. 1. General view of nerve cell involvement (Nissl stain). Note the diffusion of the lesions and the intensity of the processes.

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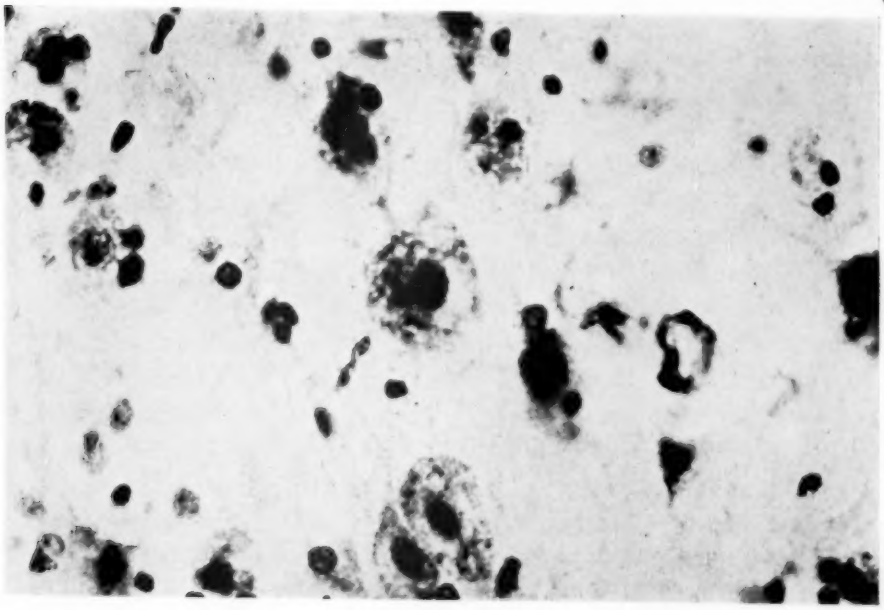

Fig. 2. Details of involved nerve cells (Nissl stain). Liquefaction takes place through increasing vacuolization. The nucleus and nucleolus appear pyknotic.

and hyperplasia leading to a fibrous reaction especially surrounding the blood vessels (Fig. 6). Hypertrophy of the astrocytes with less marked degenerative changes is also evident in the most external layer of the cortex (lamina molecularis), whereas, here and there a slight marginal gliosis is detectable.

The oligodendroglia cells of the gray matter have undergone a diffuse process of acute swelling. There is no trace of progressive changes of these elements nor of the microglia cells which, in contrast with the astrocytes, are much better preserved. In some areas in the presence of considerably disintegrated nerve cells the microglia element discloses here and there an acute swelling of its cytoplasm comparable to the acute swelling of the olidogendroglia (Fig. 7). Here and there also elements are found with prolongments undergoing clasmatodendrosis (Fig. 8) but on the whole the microglia structure is well preserved and contrasts with the severity of the involvement of the nerve cells and of the astrocytes.

The myelin sheath preparation discloses a rarefaction of myelin which in some areas of the cortex appears considerably disintegrated. Swollen myelin sheaths and the remnants of some others are seen here and there in the most involved areas. Corresponding to the more severely affected areas the axis cylinders also appear swollen and some of them disintegrated. Disintegration goes from gross fragmentation to a minute granular involvement of the fibers.

The blood vessels show a thickened adventitia, but most of them disclose no signs of proliferation of the intima. The lining endothelium appears swollen here and there but no signs of nuclear division nor of multiplication of the elements are encountered (Fig. 9). Only occasionally, here and there, the small blood vessels show a thicker lining endothelium, but the process is, altogether, far from the endarteritic process as described by previous investigators in other types of animals. No perivascular infiltration of blood elements has even been encountered. Fat is seen only occasionally in the perivascular sheaths. The scarcity of the fat contrasts strongly with the severe degree of degeneration of the nerve cells and points out to the possibility that this type of disintegration does not lead necessarily to the formation of disintegrated fat or that the chemical stage of the degenerative fat is not detectable with our common stains.

*Parietal Region*—The changes involving the nerve cells are very pronounced and of the same type as described in the frontal area. Most of the elements are undergoing a process of liquefaction leading to the formation of acellular areas. Nerve cells are also seen which disclose lighter degree of involvements consisting mainly in complete chromatolysis of the Nissl substance and some shrinkage and pyknosis of the nucleus. Other elements show instead a swollen nucleus, very poorly stained, and which gradually fades out.

The changes in the astrocytes and microglia and oligodendroglia elements are identical with the ones described in the frontal areas. The contrast between the degenerative changes of the gray matter and the progressive reaction of the white matter is as striking as in the frontal area. Blood vessels, myelin sheath, and nerve fibers react in the same manner as in the frontal area.

*Temporal Convolution*—Discloses a milder degree of degeneration of the nerve cells and neuroglia reaction.

*Occipital Region*—The nerve cells are as considerably involved as in the frontal area. Most of the changes consist here also in the so-called severe type of disease or liquefaction of the nerve cells. The reaction of the neuroglia and of the microglia does not differ from what already has been described in other areas. The same applies to blood vessels, myelin sheaths, nerve fibers, and fat products of disintegration.

*Basal Ganglia*—The nerve cells of the caudate nucleus, putamen and pallidus are diffusely involved, most of them showing more or less advanced liquefaction. The astrocytes of the gray structures (putamen and pallidus) show considerable degenerative changes, ameboid appearance, swelling and clasmatodendrosis, whereas, the astrocytes of the internal capsule are much better preserved and even show hypertrophic reaction. In the thalamus also the astrocytes are considerably degenerated and more so in the ganglion habenula.

*Pontine Nuclei*—The nerve cells of the pontine nuclei are better preserved than the cortical elements although many of them are found in a stage of more or less advanced chromatolysis and liquefaction.

*Cerebellum*—The striking feature is the diffuse involvement of the Purkinje cells which are severely affected and present a very

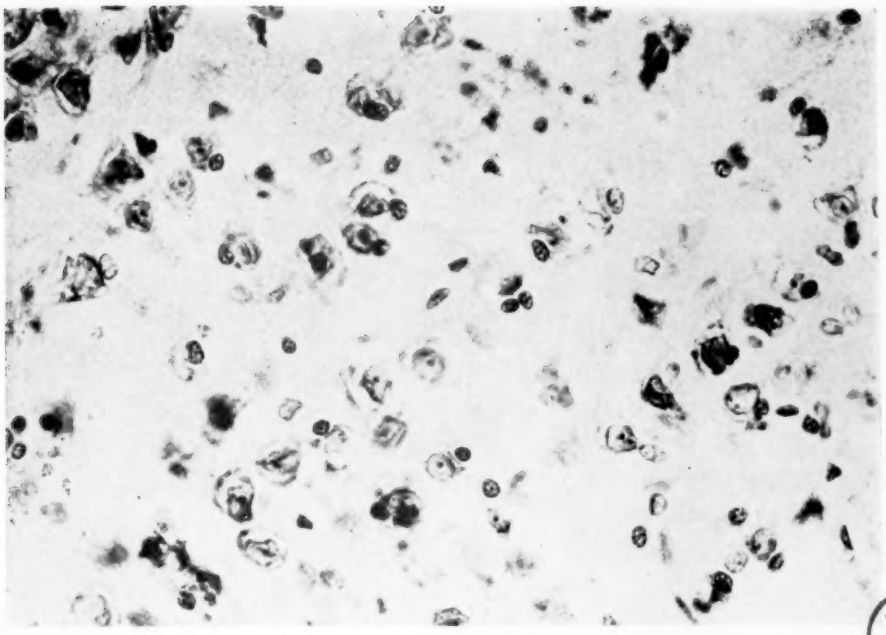

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Fig. 3. Liquefaction of nerve cells (Nissl stain). In contrast with Fig. 2 the nucleus is also undergoing an acute process of swelling.

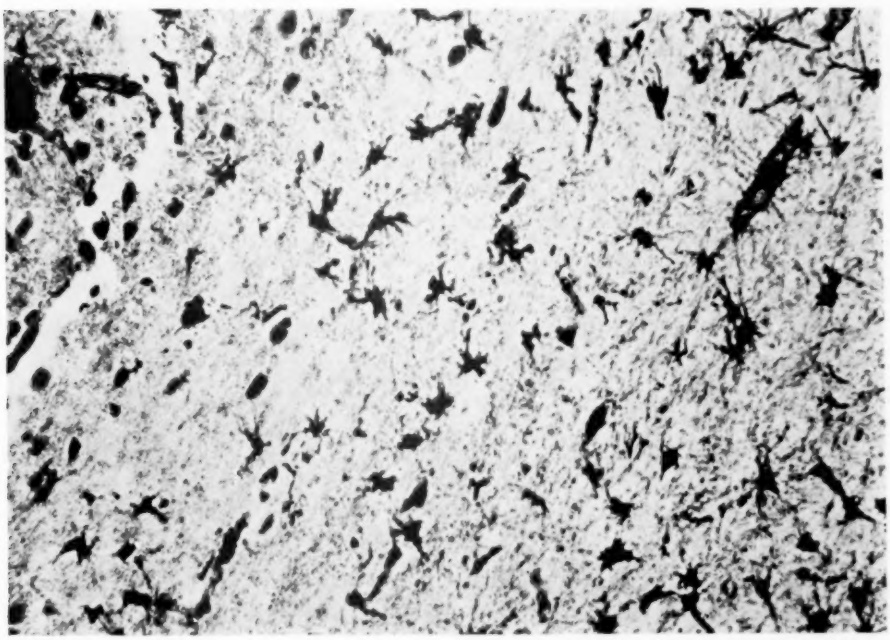

Fig. 4. Degenerated astrocytes in the cortical gray matter (Cajal gold sublimate method). Note considerable clasmatodendrosis and the deformities of the various elements.

advanced stage of homogenization, the chromatin substance having entirely disappeared and the nucleus being barely visible (Fig. 10). Other elements, however, show a deeply stained nucleus and a more or less advanced process of liquefaction. In the lamina granularis the granules have a tendency to fuse together thus creating a condition which one of us (Ferraro[78]) has called conglutination of the granules (Fig. 11) and described as such in illuminating gas poisoning.

The astrocytes of the lamina granularis are hypertrophic and fibrous in type. Most of them seem to be preserved from injury, whereas, the same cells of the lamina molecularis seem to undergo diffuse degenerative changes. Microglia and oligodendroglia are very poorly stained.

*Formatio Reticulata Pons*—The large nerve cells which are scattered in this structure appear considerably involved.

*Cervical Cord*—The involvement of the nerve cells is not as diffuse and pronounced as that found in the brain cortex. Nevertheless, numerous nerve cells are seen undergoing degenerative changes from the stage of acute swelling to the one of vacuolization, liquefaction, and distintegration. It seems that the smaller cells are more severely involved and that the lesions are most pronounced in the cells of the lateral and posterior horns. The large motor cells of the anterior horn, though involved by the process, seem to resist more the degenerative influence. Cells are, however, seen undergoing a granular disintegration of the Nissl bodies leading to a complete disappearance of the chromatin substance and gradual fading out of the element (Fig. 12). The astrocytes of the gray matter of the cord discloses the same type of changes as that described in the cortex, consisting mainly in acute degenerative changes, swelling, and disintegration of the elements (Fig. 13). The microglia and oligodendroglia elements do not seem to take well the silver impregnation, probably because of the particular reaction of the tissue impregnated by lead. In the white substance the astrocytes appear more fibrous and better preserved, the myelin sheaths are somewhat swollen, especially along the marginal area where the Marchi stain discloses numerous degenerative ring-like formations (Fig. 14). The nerve fibers, both in transverse and longitudinal sections show marked degenerative changes, fragmen-

tion, and disintegration. The zone of entrance of the posterior root seems particularly involved (Fig. 15).

*Thoracic Cord*—The nerve cells are somewhat better preserved than the cervical cord. The glia reaction is, therefore, less pronounced, whereas, the myelin sheaths and nerve fibers, especially in the antero-lateral columns and in the Redlich-Obersteiner areas, appear considerably degenerated.

*Lumbar Cord*—The lesions of nerve cells, glia cells, and nerve fibers compare very closely to those in the thoracic cord.

*Sciatic Nerve and Brachial Plexus*—The various nerves show swelling of the axis cylinder and here and there a more pronounced involvement of the fibers, including the axis cylinders. The osmic acid impregnation with the Fleming fluids or with the Marchi solution discloses several deposits of reduced osmic acid which involves some segmental portions of the peripheral fiber (Fig. 16). Rarely is the involvement of the segment global and very often one or two segments are seen breaking into small fragments of reduced osmic acid material. With the aniline blue orange G stain the axis cylinders may be studied and it can be seen that numerous axones are swollen, and more so at the junction of two interanular segments. Occasionally the axis cylinders appear quite granular and in a few instances fragmented and disintegrated.

The involvement of the peripheral nerve fibers is, therefore, more of the type of the segmental periaxial neuritis, and moreover, here the degenerative process is considerably less intense as compared with the one in the spinal cord (white substance especially) and in the brain tissue.

*Muscular Tissue*—Pieces of muscles of the femoral quadriceps and brachial biceps have been studied and the main involvement consists in fatty degeneration of some of the muscular fibers (Fig 17 a and b). The process seems to be a slow one, progressive in type, and does not involve the whole length of the muscular fiber. It seems that in the muscle also the involvement of the fiber is salutary, that is, more or less segmental in type, involving some of the fibers and in each fiber only one or more portions of it. The involved segments appear somewhat granular and with appropriate stains disclose collections of fatty material which gradually replace the muscular tissue. The striations gradually disappear while some of

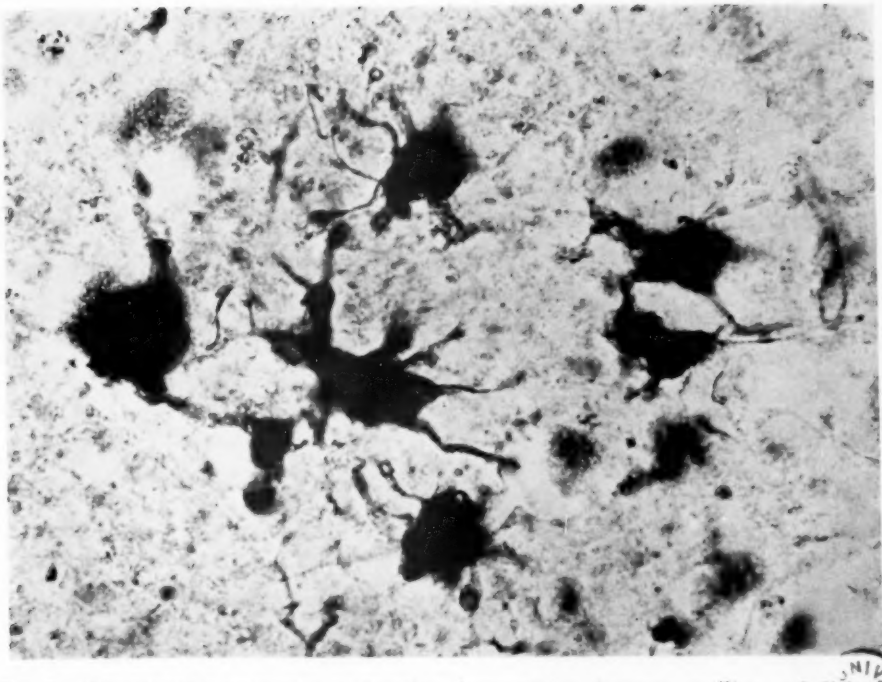

Fig. 5. Hypertrophic astrocytes undergoing degenerative changes; swelling and disintegration of the prolongments (Cajal gold sublimate method).

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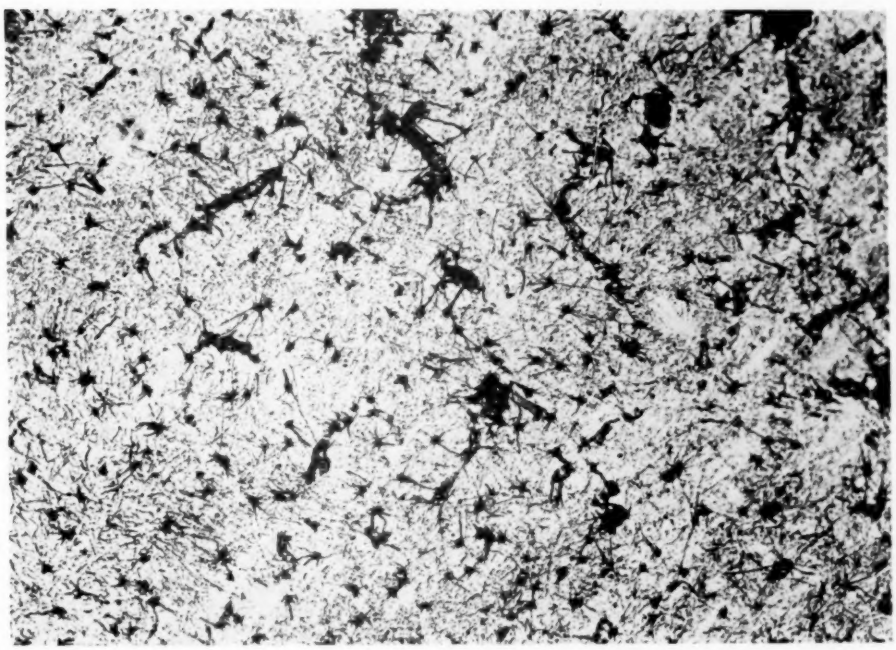

Fig. 6. Glia reaction in the white substance (Cajal gold sublimate method). Note the proliferative changes of the glia cells leading to diffuse, but more particularly, perivascular gliosis.

the nuclei of the sarcolemma disclose also a fatty degeneration. Some of the fibers appear swollen and hemogeneously stained in a diffuse bluish mat color (with H. and E.) and occasionally fragmented. In connection with these changes an increase in the nuclei is detectable. The fatty degeneration is quite characteristic for a toxic condition and compares with the same changes found in phosphorus poisoning. While these changes may be primary in type, the addition of fragmentation, swelling and homogenization may be the result of changes secondary to the involvement of the peripheral neurone. The intensity of the degenerative process in the muscular tissue is a moderate one compared with the severity of the involvement of the central nervous system.

*Cat. No.* 2—Survived 62 days. Lead carbonate in the food in daily doses of .71 grams.

### Histological Study

*Frontal Region*—The meninges are slightly thickened, but show no inflammatory signs, the thickness being due to increased connective tissue. The lamination, although well preserved, points to the presence of numerous areas where the nerve cells have completely disappeared. There is a diffuse involvement of the small nerve cells, especially in the outer layers of the cortex and consisting in all stages from beginning chromatolysis to complete liquefaction. The astrocytes appear at times hypertrophic in the cortex, but at the same time often show very pronounced degenerative changes consisting in swelling and breaking down of the processes. Some of the elements have lost all their prolongments and have a very typical ameboid appearance. The microglia and oligodendroglia, wherever the impregnation is sucessful, show only moderate degenerative changes, contrasting with the severely involved astrocytes. The same contrast reported in the previous case exists between the hyperplastic and hypertrophic astrocyes of the white matter and the degenerated ones of the gray matter. The blood vessels of the cortex disclose a swollen endothelium but very few of them suggest proliferation of the lining elements. The nerve fibers and myelin sheaths are comparatively much better preserved than the nerve cells and astrocytes. Only scarce products of fat disintegration are found surrounding the blood vessels.

*Parietal Region*—The histological picture is essentially the same as the one described in the frontal area.

*Temporal Region*—The histological features are essentially the same as those described in the frontal region, with the exception that in the first and second temporal convolutions the lesions seem to be less pronounced that in the third one where practically all the cells are undergoing an advanced process of liquefaction.

*Occipital Region*—While the nerve cells show the usual acute and toxic lesions and the astrocytes also participate intensely in the degenerative process, the microglia seems much better preserved. It is, however, easy to find here and there elements, the processes of which appear fragmented, which fact points to degenerative changes despite the well preserved cell body. We might be dealing here partly with an artefact of technique due to an incomplete impregnation of the microglia processes. Some of the blood vessels of the region show a mild process of endarteritis. Myelin sheaths and nerve fibers also participate in the process to the same extent as described in the previous case.

*Basal Ganglia*—The caudate nucleus, the pallidus, and the putamen disclose a large amount of nerve cells undergoing acute degenerative changes. The cells which are more severely affected seem to be the smaller ones, whereas, the larger elements of the pallidus are less involved. The reaction of the astrocytes in these regions is analogous to that found in the brain cortex. A few blood vessels show a definite swollen endothelium. In the internal capsule numerous so-called grape-like areas of disintegration are found (Fig. 18). In the thalamus the lesions are fundamentally the same, perhaps more severe in the region of the anterior nucleus and ganglion habenula.

*Mesencephalon*—Some of the cells of the substantia nigra appear severely involved, whereas, the large elements of the red nucleus are better preserved.

*Pons*—The small cells of the formatio reticulata show various degrees of chromatolysis and liquefaction, whereas, the pontine nuclei are not severely damaged.

*Cerebellum*—The Purkinje elements show diffuse homogenization and many others are undergoing more or less complete liquefaction. In the lamina granularis there is a certain amount of conglut-

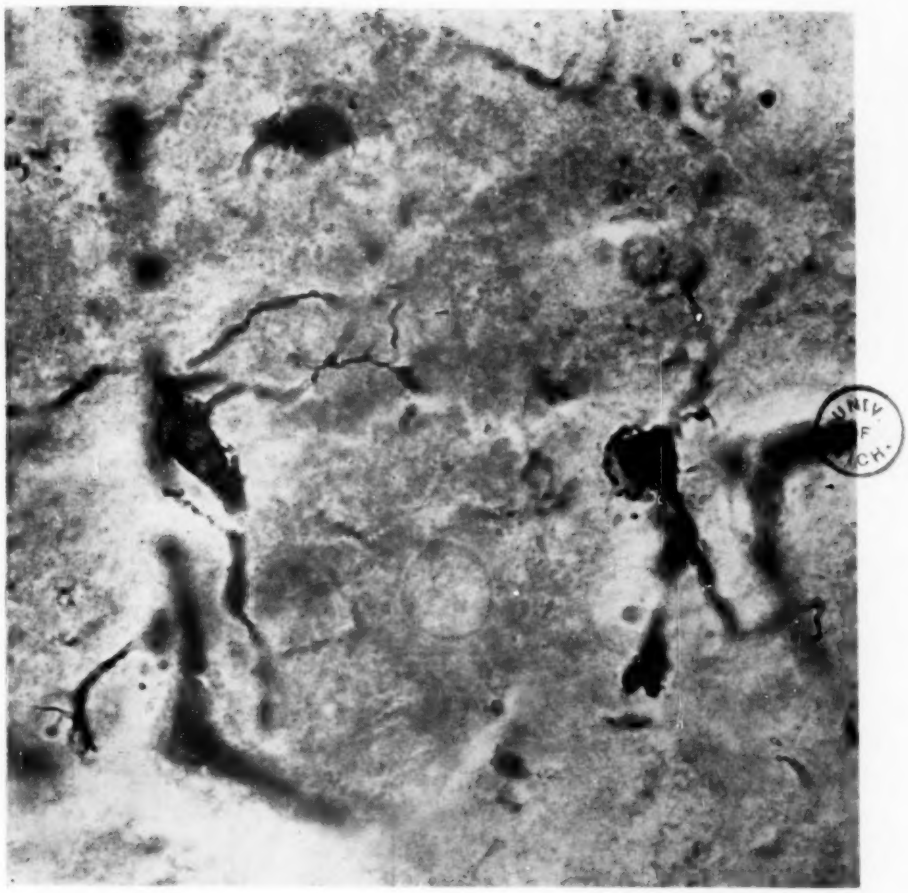

Fig. 7. Swollen microglia elements (Hortega silver impregnation method as modified by Globus and Penfield)

ination of the granules in association with hyperplasia and hypertrophy of the astrocytes.

*Cervical Cord*—The large motor cells appear grossly well preserved, whereas, the smaller cells of the anterior, lateral, and posterior horns show definite evidence of degeneration. The central canal is dilated and surrounded by hyperplastic astrocytes. These elements show all over the gray matter degenerative changes and transformation into ameboid elements due to the breaking down of the prolongments and irregular swelling of the cell body. The impregnation of the microglia and oligodendroglia is difficult to obtain. In the white matter numerous fibers are seen degenerated in the lateral columns, especially at the periphery and in the zone of entrance of the posterior root. The posterior columns appear also involved. No definite signs of endarteritis are found in the spinal cord.

*Thoracic and Lumbar Cord*—Disclose essentially the same changes as the cervical segments, with the exception that the lesions in the posterior columns seem to be slightly more pronounced.

*Sciatic nerve and cervical plexus*—A few axis cylinders are swollen and a few others more or less disintegrated, presenting a ball-like or club-like termination of the fragments. With the Marchi method only a slight amount of reduced osmic acid is detected occupying the area between one or two interanular segments, whereas, with the Spielmeyer method for myelin sheaths numerous myelin sheaths appear swollen and a few of them finely granular. Though a certain number of fibers are involved the peripheral nerves seem to be comparatively much better preserved than the nerve cells of the central nervous tissue.

*Muscular Tissue*—Degenerative changes of muscular fiber of the quadriceps and biceps are evident. Scar proliferation of the nuclei but no inflammatory changes. The lesions consist mainly, as in the previous cases, of segmental fatty degeneration and of occasional fragmentation and homogendization of some muscular fibers.

*Cat. No.* 3—Survived 58 days. Daily administration of .84 grams of lead carbonate with the food.

HISTOLOGICAL STUDY

*Frontal region*—The meninges are slightly thickened but no vascular nor inflammatory changes are detected. The lamination is

well preserved. The lesions of the nerve cells are very pronounced all over the sections, involving indistinctly all the various layers. It seems, however, that the external layers are more susceptible to a pronounced liquefaction. In the internal layers a few nerve cells appear shrunken with a deeply stained cytoplasm and nucleus. The astrocytes show the same degenerative changes as repeatedly described in the cortex of the two previous animals. Here the impregnation of the microglia and oligodendroglia has been somewhat more successful and discloses more definite pathological changes. The oligodendroglia elements seem to react almost exclusively with a slight degree of swelling of the cytoplasm, whereas, the microglia elements show a much better preserved cell body. Here and there, especially in the vicinity of some blood vessels the same microglia elements are found disclosing swelling of the cytoplasm and rosary bead appearance of some of the prolongments. There is no question, however, that there is a striking difference between the reaction of the astrocytes, which are severely involved, and the reaction of the microglia which seems to participate only midly to the toxic process. Fat products of disintegration are scarce all over the region. Myelin sheaths and more fibers are only slightly involved. In the white matter there is the usually progressive reaction of the astrocytes.

*Parietal Region*—Discloses practically the same structural changes as described in the frontal region.

*Occipital Region*—A certain number of nerve cells disclose shrinkage of their cytoplasm. The shrinkage is especially pronounced in the internal layers of the cortex where some of the blood vessels disclose a slight degree of endarteritis. Here and there an apparent increase of capillaries is even detectable. The astrocytes disclose all over the gray matter the same degenerative changes, which in some instances have followed a primary hypertrophy of the elements. Fat products of disintegration are very scarce all around.

*Temporal Region*—The lesions are substantially the same as those described in the frontal areas.

*Basal Ganglia*—There is the same dominance of small nerve cells undergoing degeneration. Grape-like areas of disintegration are especially numerous in the region of the internal capsule.

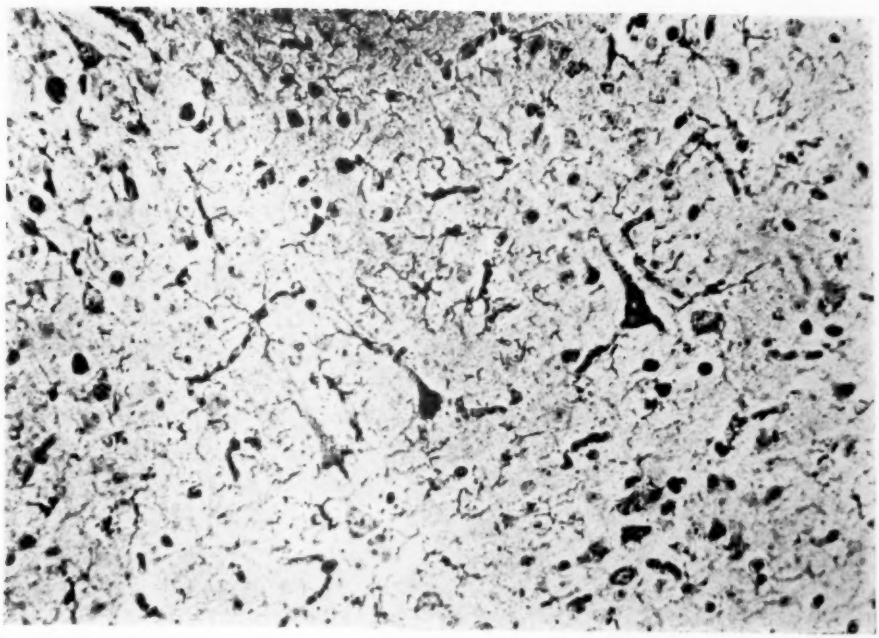

Fig. 8. Microglia element showing breaking down of processes (Hortega silver impregnation method as modified by Globus and Penfield).

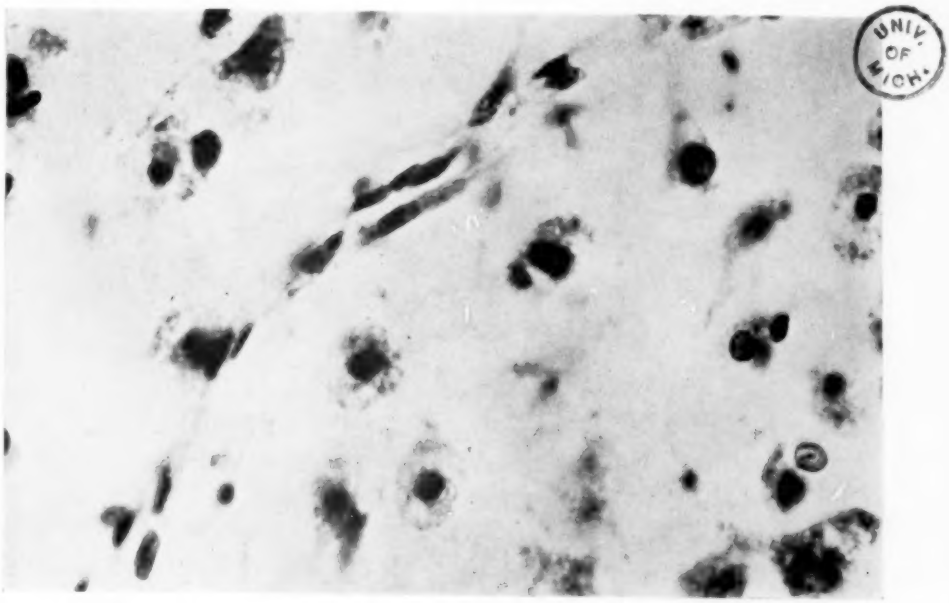
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Fig. 9. Blood vessels showing absence of hyperplastic changes.

*Mesencephalon and Pons*—There is the same diffuse involvement of nerve cells of the formatio reticulata and of the pontine nuclei. In the cerebellum the same involvement of the Purkinje cells which appear homogeneous and occasionally in a state of liquefaction. The reaction of the astrocytes and other elements of the glia is practically the same as the one described in the previous case.

*Cervical Cord*—The cells of the anterior horn, including the large ones, seem more involved by the process, which consists mainly of an advanced stage of chromatolysis of some of the large elements and liquefaction of the small ones. The Nissl substance of the large motor cells appears involved as a dust-like substance spread throughout the cell body and with a tendency towards disintegration. The changes in the astrocytes of both gray and white matter are comparable to those described in previous cases and the involvement of the white substance is practically of the same intensity as in Cat No. 2.

*Thoracic and Lumbar Cord*—The changes are also here more pronounced than in Cat No. 2 and in the lumbar cord it seems as if the motor cells of the anterior horn were more severely involved. The astrocytes are especially more degenerated, the entire gray matter being filled with fragments of broken processes.

*Cervical and Lumbar Plexus and Sciatic Nerve*—The same moderate degenerative changes as previously described.

*Cat No.* 13—Animal survived 33 days. Received daily doses of 1.5 grams of lead carbonate in addition to five intravenous injections of 1.5 c.c. of one per cent lead acetate solution every five days, six intravenous injections in all.

### Histological Study

*Frontal Region*—The lamination is greatly disturbed. The large and small nerve cells of the outer and inner layers are undergoing a diffuse process of chromatolysis, liquefaction, and gradual disintegration. There is a slight degree of endarteritis of the small blood vessels somewhat more pronounced than in the case where lead was administered exclusively by mouth. The reaction of the astrocytes is of the same type as the one described in the previous cases, the only difference consisting in the fact that the degenera-

tive changes are somewhat more pronounced. The oligodendroglia and microglia elements are much better preserved as compared with the astrocytes. The usual tendency to gliosis is noticeable in the white substance. The fat products of disintegration are slightly more abundant than in the previous cases.

*Parietal Region*—The lamination is here better preserved than in the frontal region. The lesions of the nerve cells are, however, diffuse and of the same fundamental type. Slight endarteritis of the blood vessels here is also evident. The reaction of the astrocytes, of the oligodendroglia, and microglia is identical with the one in the frontal region. Abundant fat globules in the perivascular spaces.

*Occipital Region*—The same changes as described in the frontal area are present. Here, however, it seems as if the acellular areas were somewhat more numerous than in the frontal region.

*Temporal Region*—The nerve cells, astrocytes, oligodendroglia, and microglia react in the same manner as described in the frontal region. There are, however, a few areas surrounding some of the blood vessels where the microglia cells are more than usually swollen and in some of the areas there is even a tendency to a transformation of the elements into gitter cells, although very little fat is found in them. The blood vessels for the most part disclose a swollen endothelium and occasionally, here and there, proliferative changes are also encountered.

*Ammons Horn*—Nerve cells here are undergoing severe acute degenerative changes which are very pronounced especially in the lamina pyramidalis, whereas, the elements of the fascia dentata are somewhat better preserved. The degenerative changes of the astrocytes are also somewhat more pronounced in this region. The blood vessels show more than usually a swollen endothelium.

*Basal Ganglia*—Numerous nerve cells of the lenticular and caudate nucleus are seen undergoing degenerative changes mostly of the liquefaction type. There is a certain amount of endarteritis, especially in the blood vessels of the internal capsule where perivascular deposits of fat are frequently found. A few small foci may be seen in the putamen where, surrounding the blood vessels, numerous proliferated oligodendroglia and microglia elements are found.

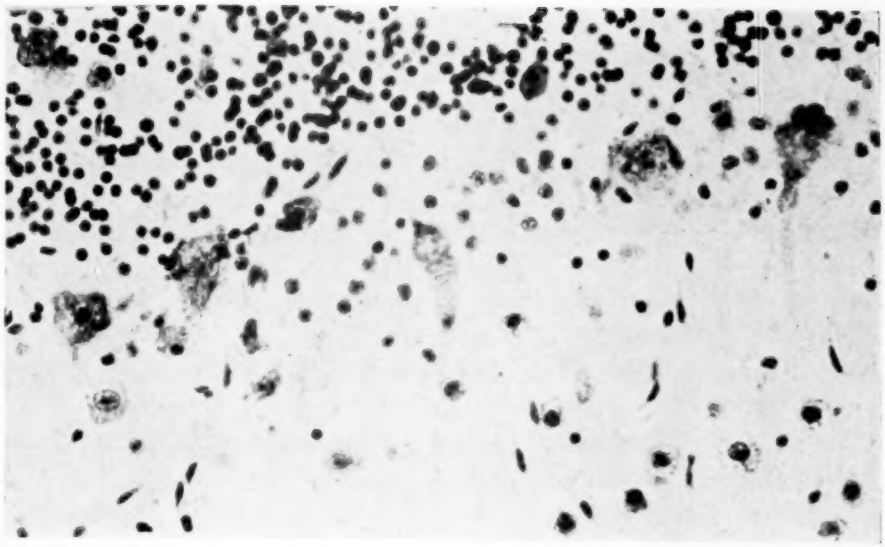

Fig. 10. Purkinje cells undergoing various stages of liquefaction (Nissl stain).

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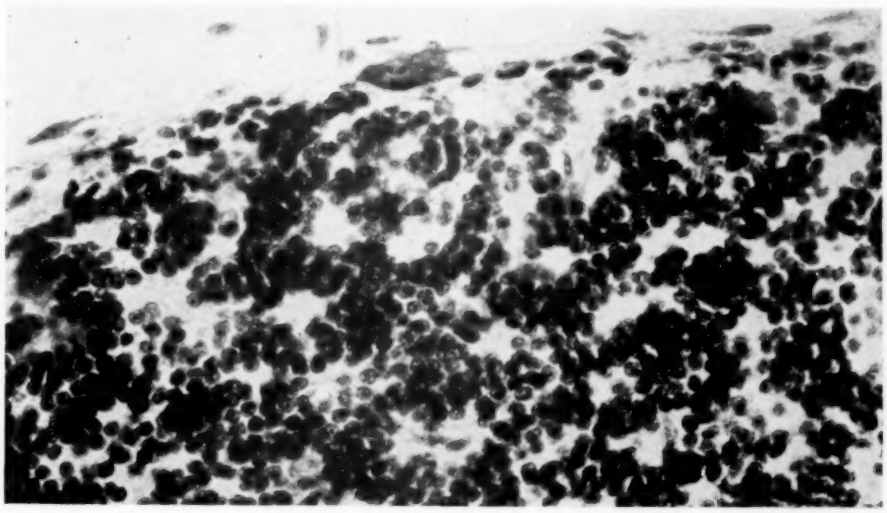

Fig. 11. Conglutination of the lamina granularis of the cerebellum (Nissl stain).

*Thalamus, Mesencephalon and Pons*—The nerve cell changes are comparable to those found in the cortex with the same difference already mentioned, that the smaller the elements, the more they seem to react.

*Cerebellum*—The layer of Purkinje cells is considerably involved with a large number of elements undergoing a process of liquefaction.

*Cervical Cord*—The large nerve cells are fairly well preserved, although some of them show evidence of fatty degeneration, a rather unusual occurrence in this type of poisoning. A few of the smaller nerve cells in both anterior and posterior horns and some of the elements of the lateral horn are undergoing a definite process of chromatolysis and gradual liquefaction. The astrocytes have undergone the same degenerative changes as detectable by clasmatodendrosis and ameboid transformation of the cell body. Marked degenerative changes of the myelin sheaths and nerve fibers are found along the circumferential zones with no particular predilection for any one of the various white columns. In longitudinal section the axis cylinders appear swollen and some present club-like endings, whereas, some others disclose intercallated swellings giving to the axis cylinders a rosary bead appearance.

*Thoracic Segment*—Some of the nerve cells are deeply stained and shrunken. They are surrounded by other elements in a stage of liquefaction and by others, more numerous, in a stage of diffuse chromatolysis. Here also some of the nerve cells contain a large amount of fat products. The oligodendroglia and microglia elements are more severely involved though in a lesser amount compared with the involvement of the astrocytes.

*Lumbar Segment*—The same lesions as in the thoracic segment, with the difference that here the posterior columns seem somewhat more involved, and numerous deposits of metachromatic substance are scattered in this region.

*Brachial Plexus and Sciatic Nerve*—The lesions of the peripheral nerve fibers are somewhat more pronounced than in the previous cases. The type of lesion is always fundamentally the periaxial type of neuritis as only one or two segments are involved, the remainder of the fibers being much better preserved. The general swelling of the fibers and myelin sheaths is also more pronounced than in the previous cases.

*Muscular Tissue*—The changes are essentially the same as in Cat No. 1.

*Cat. No.* 12—Survived 21 days. Received intravenous injections of 1.5 c.c. of one per cent solution of lead acetate every fifth day and 1.5 grams daily of lead carbonate in the food.

HISTOLOGICAL STUDY

*Frontal Region*—Numerous nerve cells are undergoing the same diffuse process of liquefaction and gradual disintegration. However, numerous cells are seen in a stage of shrinkage. The astrocytes in the gray matter are undergoing the same acute degenerative changes as described in the previous animal, although at the boundary between the white and gray matter the hypertrophic changes are somewhat more marked. Numerous elements are, however, found with hypertrophic bodies but swollen and fragmented processes. The oligodendroglia cells appear diffusely swollen and some of the microglia elements show definite degenerative changes consisting also in swelling and fragmentation of the prolongments. No definite hypertrophic changes nor transformation into compound granular corpuscles are found. The blood vessels show a swollen endothelium and only a few of them disclose proliferated elements in the intima. The fat products of disintegration are here also scarce and generally embedded in the perivascular spaces.

*Parietal Region*—There is a diffuse chromatolysis and liquefaction of the nerve cells involving practically all the various layers, but more so the external ones. The disintegration of the nerve cells leads to a destruction of many of them disturbing the cytoarchitecture of the region. As a matter of fact, numerous areas are seen in which only remnants of nerve cells may still be detected. The changes involving the astrocytes, oligodendroglia, microglia, and blood vessels are identical with those mentioned in the frontal region.

*Occipital Region*—The lamination is greatly disturbed due to the presence of numerous avellular areas, especially in the external pyramidal and internal granular layers. The astrocytes show the same hypertrophic and degenerative changes usually found.

*Temporal Region*—The lesions are the same as in the frontal area except for the more abundant deposits of fat in the perivascular spaces.

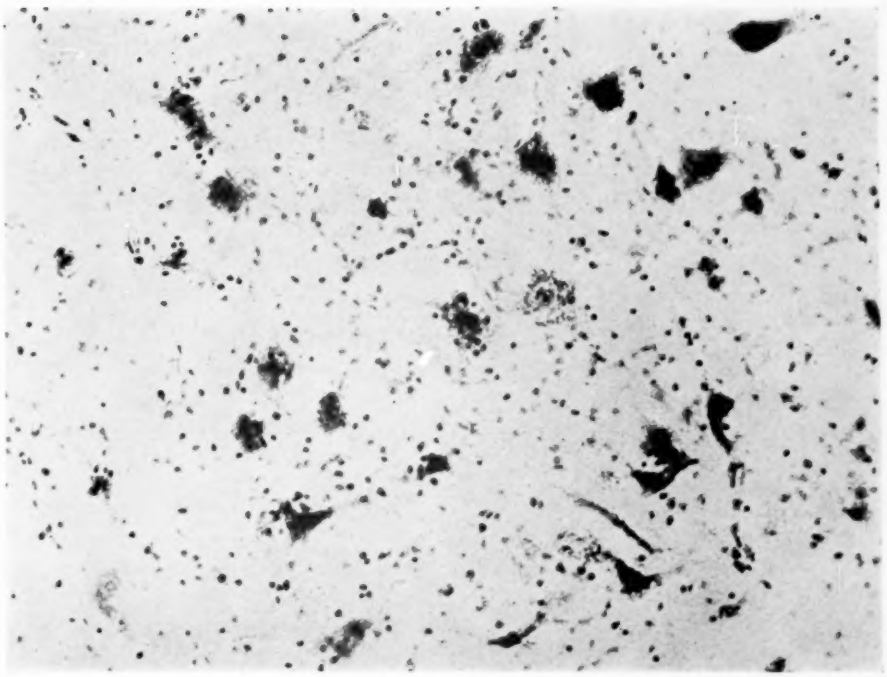

Fig. 12. Motor cells of the anterior horn of the spinal cord. Several cells are seen undergoing the same fundamental process or liquefaction as described in the brain cortex (Nissl stain).

Fig. 18. Grape-like areas of disintegration in the internal capsule (H. and E.).

*Ammons Horn*—Pronounced chromatolysis and liquefaction of nerve cells. The astrocytes are better preserved, especially in the white substance. The microglia elements show mild degenerative changes and the oligodendroglia cells show diffuse acute swelling.

*Basal Ganglia*—Numerous cells of the putamen and pallidus, especially the small ones, appear shrunken among other elements which are swollen and in a stage of more or less advanced liquefaction. In the caudate nucleus the disintegration of nerve cells is somewhat more diffuse and the degenerative changes of the astrocytes quite pronounced. Hypertrophy of the glia element is evident in the internal capsule especially surrounding the blood vessels.

*Mesencephalon*—The small cells of the red nucleus and the small cells of the zona reticulata and of the substantia nigra show liquefaction of the cell body and gradual disappearance of the Nissl bodies and cell membrane. The astrocytes of the region do not show severe changes nor do the blood vessels. In the pons and in the formatio reticulata tegmenti and in the higher portion of the medulla oblongata numerous cells are found diffusely scattered and disclosing the same fundamental changes of chromatolysis and liquefaction.

*Cerebellum*—There is a considerable destruction of Purkinje cells and some folia show only few remnants of disintegrated elements. The astrocytes are hypertrophic in the lamina granularis where microglia elements disclose swollen dendrites and a tendency to fragmentation of the prolongments. Very little fat tissue is found in the region.

*Cervical Cord*—In the cervical region of the spinal cord the large cells of the anterior horn seem better preserved than the smaller ones although large elements are also seen in which the Nissl bodies are undergoing a process of granular disintegration which leads occasionally to a complete chromatolysis. Occasionally also in a few large cells liquefaction has taken place. The microglia elements in the gray matter seem to be more severely affected than usual, the lesion being mostly of the degenerative type (acute swelling and fragmentation). On the other hand, the astrocytes are severely degenerated contrasting with a much better preservation and hyperplasia of the elements in the white substance. In the posterior

columns several degenerated fibers are found, especially in the zone of entrance of the posterior root.

*Thoracic Cord*—The lesions are identical with those described in the cervical region as to type and intensity.

*Lumbar Cord*—The nerve cells are somewhat more damaged and a few more large cells are found undergoing acute severe degenerative changes. Neuronophagia is quite evident. The changes in the astrocytes, microglia, and oligodendroglia are practically the same as those described at higher levels. There is a more pronounced involvement of the circumferential zone of the white substance and of the posterior columns where the Marchi stain shows numerous degenerated myelin sheaths.

*Brachial and Lumbar Plexus and Sciatic Nerve*—Only a few peripheral fibers are seen degenerated. The process involves mostly the myelin sheath which appears fragmented and transformed into small balls of reduced osmic acid. The occurrence of such osmic bodies is seen, however, in only a few segments of the nerve fibers and entire microscopical fields are encountered free from any trace of such products. In general, however, the myelin sheaths appear swollen and occasionally granular as a forerunner stage of more advanced disintegration. The axis cylinders, though grossly well preserved, disclose a diffuse slight swelling in several of the fibers. Only very occasionally considerable distortion or fragmentation of this axone is detected.

*Muscular Tissue*—Slight degenerative changes are found in the femoral quadriceps consisting mainly of a certain amount of swelling of some of the muscular fibers. Occasionally the fibers appear granular and the cross striations less definite. Areas are also encountered in which the staining properties of some of the fibers are involved and the tissue appears homogeneously stained darkish blue. With the fat stain granules of thin substance are found involving part of one or more segments which lose their cross striations. The process is a degenerative one, quite mild however in comparison with the diffuse and intense lesions of the central nervous system.

(PART II WILL APPEAR IN THE APRIL ISSUE OF THE QUARTERLY)

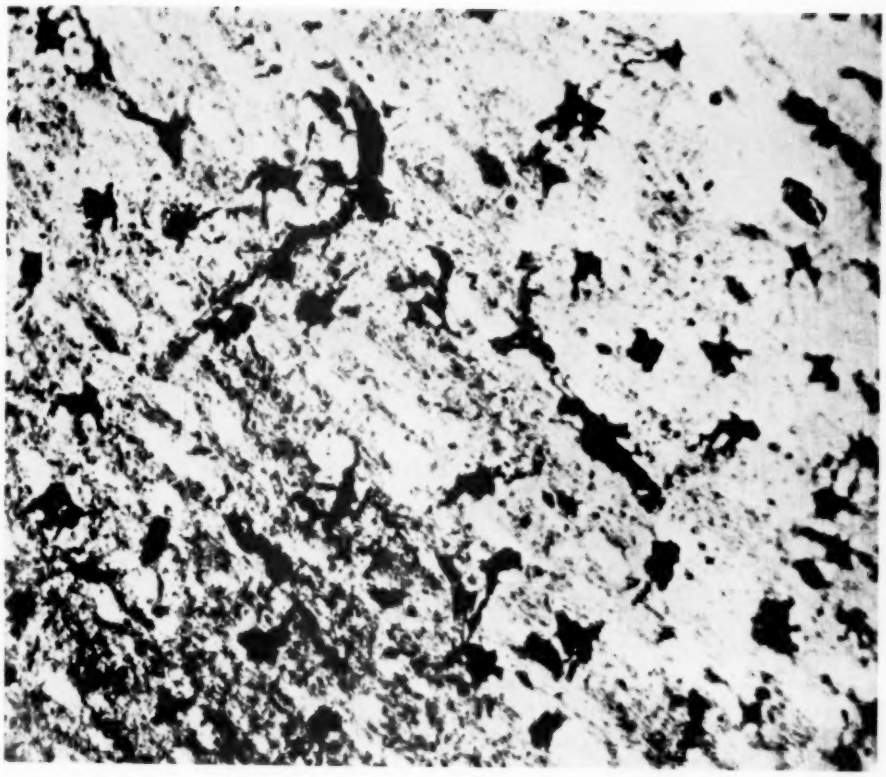

Fig. 13. Acute degenerative changes of the astrocytes in the gray matter of the spinal cord (Cajal gold sublimate method).

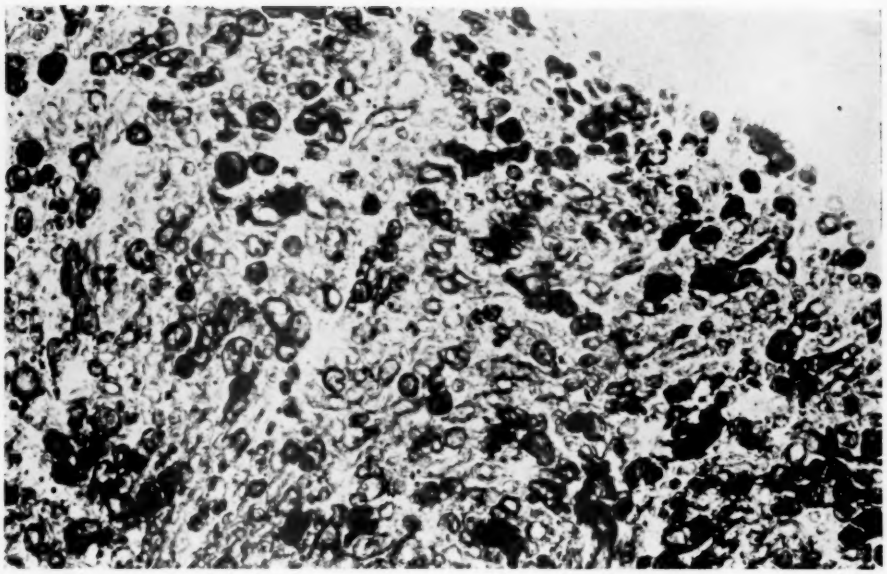

Fig. 14. Peripheral degeneration of the nerve fibers in the spinal cord. Note the ring-and-ball-like formations which stand out because of the osmic acid reduction (Marchi method for degeneration).

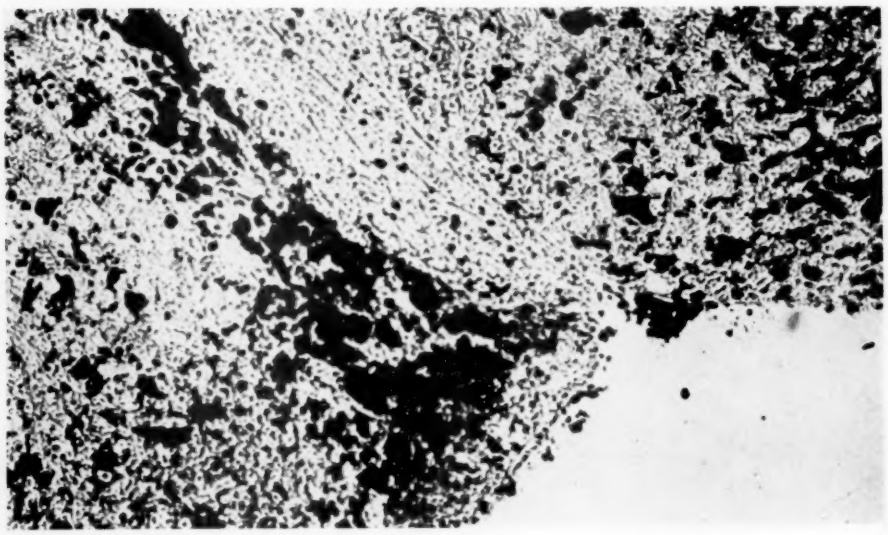

Fig. 15. Accumulation of reduced osmic acid material at the zone of entrance of the posterior root pointing to the severity of the degenerative process at this level (Marchi method for degeneration).

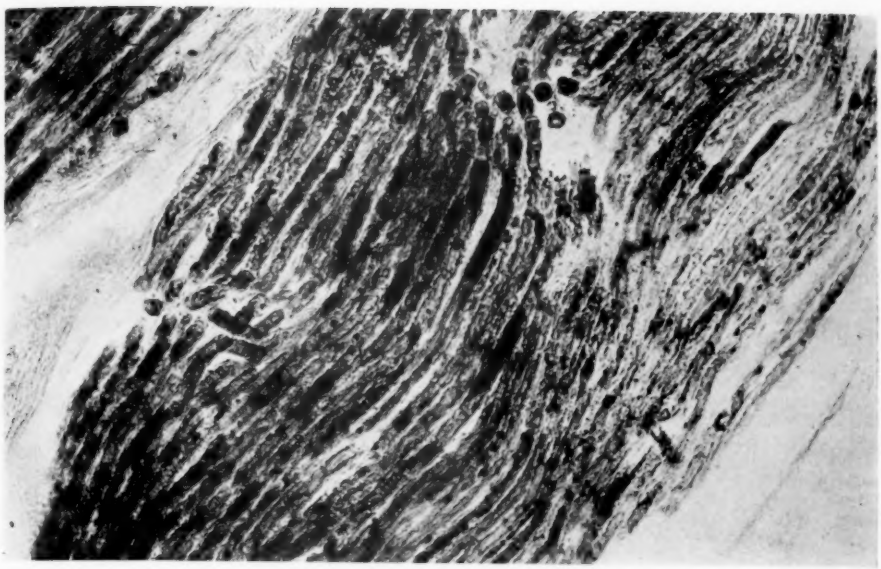

Fig. 16. Peripheral nerve disclosing segmental type of degeneration. Note the reduction of osmic acid occupying only part of the interanular segments (Marchi method for degeneration).

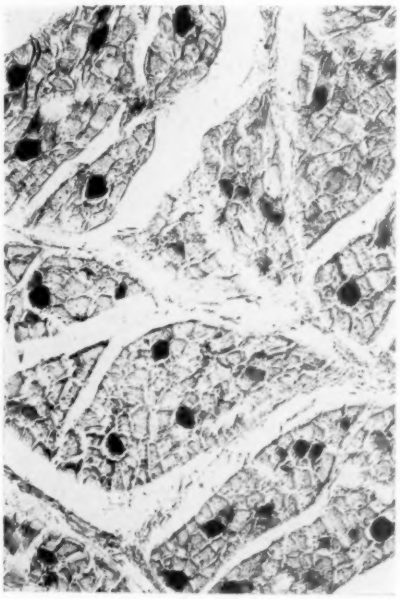

Fig. 17a. A cross-section of muscular fibers of quadriceps femoris showing numerous fibers undergoing fatty degeneration

Fig. 17b. Longitudinal section the same muscle showing segmental type of fatty degeneration of muscular fibers (Fett Ponceau for fat products of disintegration)

# THE SOCIAL WORKER'S FUNCTION IN THE COMMUNITY CLINICS*

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DIRECTOR, DIVISION ON COMMUNITY CLINICS, THE NATIONAL COMMITTEE FOR MENTAL HYGIENE

One does not have to go back fifteen years to appreciate the difference the psychiatric social worker has made in the efficiency of the clinic. It is only necessary to appreciate that a high percentage of cases in other branches of medicine have psychiatric components dependent on situational difficulties. The handling of these factors is today just about as well developed as it was in the psychiatric clinic two decades back, so that a comparison of the social work of an up-to-date medical and a psychiatric clinic of today will show the advance that has been made. Even this is true only in the more progressive clinics that take the trouble to recognize the broader determinants.

There are at present about 232 community clinics in this country having a psychiatrist, psychologist and psychiatric social worker on the staff. There are, in addition, many that have just the psychiatrist and psychiatric social worker. Ten years ago there was a mere handful, maybe 10 or 15 such clinics. I believe that much of the increased efficiency that has occurred is attributable to the extension of the confines of the clinic through the contribution of the psychiatric social worker, so that today a clinic includes not only the person of the patient and perhaps a relative, but the patient as he is expressed and influenced day in and day out in all his contacts. This broadened scope of the clinic is due not only to the addition of a new facility, psychiatric social work, but the work of the psychiatric social worker has effected a higher integration. It has changed not only the environmental understanding and approach, but as well, the physical, psychiatric and psychological examination and diagnosis. It has changed these because it has leveled certain previous obstacles to treatment and made it worth while to pay attention in examination to certain deviations and influences. Just what this integration has included besides mutual moral support within the clinic staff or whatever it is that makes a group function higher than the sum of its parts is not easily

* Presented at Conference of Social Workers of Department of Mental Hygiene, Ward's Island, September 16, 1931.

decided because clinics differ so from place to place. Similarly, the functions of the psychiatric social worker differ. The numbers of cases handled, the pressure of work, the number of workers, the size of the community and a number of other factors make for a variety of ways in which a contribution has been effected. The functions of a community clinic can be divided into five categories, administrative, clinical, educational, community organizing and research. It may be fruitful to see just how the psychiatric social worker functions in relation to each of these categories of clinic activity.

In my contact with clinics I see a great many of their internal problems. By far, the most important are the staff problems, and of these, the ones produced by personality clashes. Technical ability is, of course, indispensable, but many a person has failed to use his full ability because he has not seen as a part of his job the smoothing of relationships between different members of the staff or between clinic and community. The whole problem of adjusting to authority and of loyalty is involved in the administrative responsibilities of the social worker as well as every other staff member in a clinic and is to a great degree a test of her own mental health. This adjustment to authority involves not only her submission to authority, but in a clinic where she has assistants it involves the wisdom with which she plans their work. In an efficiently conducted clinic as much work and responsibility as possible is relegated by those who are higher paid to those who receive less. The social worker comes in for a share of this relegated responsibility and where she has assistants it devolves upon her in turn to relegate to them as many tasks as are within their capacities. It is, therefore, a serious part of her job to participate in the appointment of her assistants and safeguard their quality.

It is, of course, indispensable that a clinic develop close relationships with all community agencies that have to deal with the problems of human beings. In this relationship the social worker legimately has a responsibility for the working arrangement with the social service agencies. She is the logical staff member to do this.

In the financing of a clinic we have one of the most trying of its administrative problems. On the one hand, the clinic has to beware of assuming a responsibility which should logically rest upon some-

one else, for example, a local committee or board. At the same time, the clinic cannot withhold its assistance to those financially responsible, particularly when it comes to clarifying to a prospective donor the more technical side of the clinic's work. The opportunity for the social worker along this line is evident, and the breadth of her field frequently makes it possible to reveal the clinic's work in terms of the prospect's interests as no one else can.

In many of the smaller clinics it is unfortunately true that records are very meager. Not only is this too bad from the clinical standpoint, but also because the smaller clinic is still largely experimental and we should check on our experience as much as possible in order to make progress. In many clinics the keeping of records is under the supervision and control of the social worker.

The central point of a clinic's functions is its clinical work. From its service to patients it derives its ideas for education, community organization and research. The functions of the psychiatric social worker in clinical work are fairly well defined so that no attempt will be made here to go into these. However, programs differ considerably and the peculiarities of each program create opportunities that are not found in the features of social service work common to clinics. The success in any clinic depends upon adequate management of the clinic, adequate participation by the community, and adequate follow-up. For the small community the distance between the clinic staff and the community makes it more difficult to achieve a satisfactory level on these three points. It is an important fact to consider, in this connection, that the technical job of the social worker takes considerably longer than that of the rest of the staff and brings her into closer contact with the community so that she is in a position to play a much larger part in insuring the success of the clinic as to management, local participation and follow-up, than is any other staff member. So much is this the case that some communities have found it desirable to have a permanently local or even a full-time social worker, whereas the rest of the staff may be on part-time or imported. Where a permanently local person is not possible as a staff member the development of some local person to act as agent of the clinic is essential to efficient service. The finding or training of such a person is much more within the possibilities of the social worker than anyone else.

Where a clinic is not working full-time in a community, and most clinics are in this position, it is highly valuable to have the social worker precede the rest of the clinic. She is in a position to intelligently select cases and, thereby, conserve the efforts of the clinic as well as to give the community a better understanding of the clinic's functions. She can, as far as possible, utilize local resources in the securing of social examinations, develop local technique for this, and herself secure such of the examination as cannot be left to others. The more she utilizes local help intelligently, the more such help will grow and augment the capacity of the clinic. Practically every case referred to a clinic for examination has previously been a subject of consideration by other community agencies—doctors, public schools, courts, visiting nurses and social workers. These previous experiences are all necessary to the understanding of the case by the clinic and the compilation of these data is a logical function for the social worker who precedes a clinic session. By preceding the clinic session she also is able to arrange details of the clinic visit, including such educational work as may be a part of the program.

In anticipation of a clinic in a community there are almost always more cases for study than can be handled in the time allotted. The preliminary selection of the cases by the social worker will entail the rejection of quite a number, some of which the worker herself is able to provide with short service. In addition, some of the advice and consultation services to agencies which are developed to a high degree in very large clinics may be afforded to the community which is forced to depend upon part-time service. In the provision of these short services several motives have to be kept in mind. In addition to the motive of service to the case, there is the educational value of demonstration to the community, and the strategic value of retaining the cooperation and contact with the person referring the case which would be lost by merely rejecting the case for clinic service.

Entirely apart from new service to problem cases the social worker in her contacts with the community in advance of clinic service is able to carry out treatment which cannot be relegated to local hands and to arrange for treatment appointments for the clinic at the time of its session.

For certain treatment, local resources can, of course, be utilized and it is the function of the social worker to follow up old cases and see to what extent such treatment has been carried out and to help with difficulties that may have arisen.

Many seem to think that the smaller community can get along with social workers who are not as fully equipped as those doing the work in a more highly organized community clinic in a large city. This is a very erroneous conclusion. The fact is that it takes a much higher technical capacity to do a good social service job in a smaller community than it does in the larger city, the point being that the larger city has a great variety of indirect approaches to treatment whereas in the smaller city the social worker has to depend much more on the personal technique which she may develop with her client. The whole contribution comes from within herself by the direct approach.

The educational functions of a clinic likewise offer the social worker a large opportunity for contribution. Unfortunately, this is too infrequently recognized. An educational program of a clinic customarily provides for parental and professional education. In professional education the clinic deals with those persons in the community who routinely handle human problems as such. These professional groups include social workers, doctors, teachers, nurses, judges and others. All of these people have to deal with mental deviations as a routine part of their work and it is the objective of the clinic to carry over to these persons such of its techniques as must be appreciated for this routine job. The contribution of the social worker in this way is self-evident. Beyond parental and professional education the educational work of a clinic derives chiefly from its cases. The case shows where education is needed and it provides the lessons which are to be taught. An important motive of the educational function of a clinic should be to develop the fullest capacity of a community to do its mental hygiene job. It should look thereby toward a safe transference of as many of its functions as possible. In her relationship with the public schools, the social worker may carry out a type of short service which practically constitutes visiting teacher work. She can thereby demonstrate such work to the community and lay the ground work for a visiting teacher program which will insure the

clinic of permanent local representation of a high calibre and either release the visiting social worker from the community or at least from the school field, and allow her to place her efforts at the next point to be developed. There are opportunities, at times, of a similar sort in other agencies than the public schools, particularly visiting or public health nursing associations, and she is in a position to advance the mental hygiene component of the county nurse, the children's agent, the judge and the physician. Entirely aside from service to the community, the social worker has an important function in scouting for good talent for the social service field and providing vocational advice about social service, particularly to college groups.

The fourth function of a clinic is that of community organization. Clinic staff members participate in committees and are called on for advice in many types of community development. The social worker need not, however, wait for outside initiative before she can perform her functions along lines of community organization. As is the case with educational work, community organization is also a derivative of the clinical work. The case shows wherein the community is defective, the conditions that have given rise to delinquency and other problems. A complete clinic program considers such community defects just as seriously as it considers the problems of the child which have resulted therefrom, and it should feel just as great responsibility for laying out a plan of treatment for the community as it does for the patients. The fulfillment of this function taxes the ingenuity of the whole clinic staff and the community viewpoint of the social worker should put her in an especially important position in carrying out this function. Her success will in great part be dependent on her knowledge of achievements elsewhere and it is necessary for her to keep abreast of the patterns that have been tried out in meeting community problems throughout the country.

The fifth function of the clinic, that of research, is mentioned here primarily to give it a place in the clinic pattern. Research is something that is at present in clinics, for the most part individually conceived. In most places, the practical job leaves little time for research and yet there is nothing that will maintain the life of a clinic staff so much as being on the forefront of advancing sci-

ence. Certain research problems are necessarily handled by a clinic. In the practical problems of its own function, and in setting up a State program, the State must look toward the critical evaluation of trial and error and toward planned experimentation in order to progress. Much that has been achieved along clinical lines has been achieved in our larger cities. Seventy-five per cent of the population of the United States live in cities smaller than those for which our effective patterns have been designed, and only through critical consideration of its job can the clinic in the smaller community hope to develop patterns which will be appropriate to the conditions under which it works. Nothing perhaps can point more clearly to the opportunity facing the social worker in a State program than this fact, that the development of her job will contribute to the three-quarters of the population for which as yet no satisfactory working plan has been evolved.

# ATTEMPTS AT STAINING SPIROCHAETA PALLIDA IN SPINAL FLUID

BY NICHOLAS KOPELOFF, PH. D., AND MARGARET F. UPTON, PH. D.
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The problem of staining *Spirochaeta pallida* in spinal fluids of general paralytics offers great difficulties. Warthin, Wanstrom and Buffington[1] modified Alzheimer's method for studying cells in spinal fluids and reported positive findings of *Spirochaeta pallida* in 12 out of 101 definitely syphilitic cases in various stages of the disease.

It seemed desirable therefore to attempt to demonstrate *Spirochaeta pallida* in the spinal fluids of general paralytics. Nineteen specimens of spinal fluid were coagulated with alcohol, centrifuged, the clot removed, embedded in paraffine and sectioned. Mounted sections were stained by the Dieterle method.[2]

Few satisfactory sections were obtained because in the thick sections the silver nitrate precipitate made the slide obscure and the thinner sections crumbled. No *Spirochaeta pallida* were found in any of those preparations.

It was thought that a more satisfactory result might be obtained by making a thin smear of the spinal fluid coagulum and staining according to Dieterle's method.[2] At least two slides were made from each specimen and carefully examined. In only 3 slides were any forms found which suggested *Spirochaeta pallida*. But these were not at all convincing.

In order to check the findings smears were made from an agar culture of known *Spirochaeta pallida* and mounted sections of syphilitic liver were stained by Dieterle's method.[2] Spirochetes were easily demonstrated.

The negative results obtained in the spinal fluids of general paralytics need not necessarily be construed as proving the absence of *Spirochaeta pallida*. Atypical and fragmentary forms may result from the procedure employed which are confusing but which cannot

be adequately regarded as *Spirochaeta pallida*. Rather they may be judged to be artefacts or debris. The decision, in the last analysis, depends too completely upon the personal equation. The only justification for this note is that it may warn future investigators of the technical pitfalls to be encountered.

1. Warthin, A. S., Wanstrom, R. C., and Buffington, E. Application of the Warthin-Starry silver-agar method to the demonstration of *Spirochaeta pallida* in the spinal fluid by means of coagula obtained by the Alzheimer method. Arch. Derm. Syph. 8, 1923, 461-468.

2. Dieterle, R. R. Method for demonstraton of *Spirochaeta pallida* in single microscopic sections. Arch. Neur Psy. 18, 1927, 73-80.

# FUTURE PUBLIC EDUCATION IN MENTAL HYGIENE*

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To have a lasting effect upon mankind the principles underlying any new movement must be generally known. If this movement is of bizarre nature, no thought need be given to publicity; it will be universally discussed. But movements for human betterment need support and direction. Public education in preventive medicine whereby knowledge of the most important physical diseases has become almost universal, shows what may be accomplished. The need of fresh air, pure food and pure water is recognized everywhere in civilized countries. Maternal and infant welfare, school hygiene and industrial hygiene are widely practiced. The extent to which this movement has improved the health of the nation is incalculable. The practice of medicine can scarcely be thought of without such preventive facilities as quarantine, vaccination, sanitation, food laws and other regulations which exist today.

Mental hygiene has reached the time when a similar campaign is necessary. Its applications are quite as broad as those of public health, more significant in fact in the ultimate values in life. Child training, dependency, penology and many other problems and activities as well as the care and treatment of the mentally ill fall within its scope.

Dr. C. M. Hincks in an address at the first International Congress on Mental Hygiene in Washington in May, 1930, rightly stated that the problem of public education in mental hygiene consisted of emphasis on two aspects: The first comprises the securing of public understanding and backing for the various phases of country-wide mental hygiene progress; the second, and in many ways the most important, is the instruction of the public in the principles of mental hygiene for self-application. One is public, the other personal. While a number of people are well informed on this subject, education in mental hygiene for the great mass of the people is practically virgin soil.

* Given at the annual meeting of the American Psychiatric Association at Toronto, Canada, June 2, 1931. Published also by the American Journal of Psychiatry.

## What Should be Taught

What should be taught in mental hygiene? There are certain essentials which the public should know. The commoner forms of mental maladjustments and conflicts which so many persons experience, should be made clear. Such conditions as anxiety states, fears, depression, emotional instability, mental exhaustion, irritability, sensitiveness, undue aversions and other mental difficulties, are subjects for public education.

While it is not feasible to discuss these conditions in complete detail, much valuable information may be given. The public may be told that these symptoms do not generally arise from physical disease alone; that they are not solely inherited; that they indicate a lack of harmony in mental life; and that they are susceptible of treatment. The public may be told that through self-education in some instances and treatment by a skilled physician in others, much benefit may result.

These topics should be dealt with in a clear and simple way. A symptom such as mental depression may be dealt within a radio talk, lecture or pamphlet so that certain causes may be stated, certain symptoms indicated and underlying principles of treatment suggested. Everything known about depression cannot be told in a radio talk, a fact which is equally true of diphtheria, but information can be given which will lead to rational treatment and the abandonment of unwise methods.

In child guidance the need of parental education is well recognized. The causes and management of such universal conditions in children as temper tantrums, nervousness, backwardness, faulty habits and various other symptoms should be brought before the public. Pamphlets on child guidance distributed by the United States Children's Bureau and by the National Committee for Mental Hygiene and other organizations, represent an important move in public education. Several volumes printed by the Commonwealth Fund in the interests of child guidance are widely read. In fact, there are dozens of books on certain phases of child guidance and management.

Many other special fields in mental hygiene should be better known. Psychiatry in industry, which is comparable to public health work in industry, should be widely understood. The uses

of mental hygiene in secondary and college education should be known. The application of psychiatry to penology requires a campaign to bring about its general adoption. The implications of mental hygiene in relief work for dependent persons should be put to practical use.

### Who Should Be Taught Mental Hygiene?

Who should be taught mental hygiene? Its teaching should pervade society and its principles should be known to the man on the street. While the important facts of life filter gradually through from the more enlightened to the less informed and may eventually reach the ignorant, this process may be hastened by an educational campaign.

Special groups need special education. The entire medical profession should be more familiar with mental hygiene principles. In the future many psychoneuroses now masquerading as physical diseases will be recognized as symptoms of mental maladjustment. The importance of mental factors in cardiac, gastro-intestinal, respiratory, and other diseases will be better understood. The medical profession, however, cannot alone take responsibility for preventive work in this field. Well qualified specialists should direct it, but non-medical persons will have to carry a share of the work of public education.

Methods should be worked out by which the simpler principles of mental hygiene may be taught in the elementary schools. This measure, possibly more than any other, will firmly introduce the philosophy of mental hygiene into the everyday life of the entire population. In a mental hygiene survey of Boston, Dr. George H. Preston reports that a beginning has been made in teaching mental hygiene in some of the public schools in that city. Similar movements are mentioned elsewhere. A textbook embodying these principles for use in schools should be prepared.

### How Should Knowledge of Mental Hygiene Be Disseminated?

How should knowledge of mental hygiene be disseminated? Like other topics of public interest, it is disseminated spontaneously to some extent without any publicity. Novels appear from time to time with some problems of child guidance as the theme. Articles

on mental hygiene, sometimes by eminent specialists, appear in newspapers. Spontaneous methods of public education, however, serve a limited purpose. Press articles have more news than educational value. The supporters of public health would not wish to leave their campaign to news items. A carefully planned educational campaign by authoritative persons has continuity, gives facts which become accepted knowledge and has the confidence of the public.

### Publicity Work of the New York State Department of Mental Hygiene

A number of methods of disseminating mental hygiene have been used by the New York State Department of Mental Hygiene with a view to informing the public of important facts regarding the nature, symptoms and treatment of mental diseases, mental defect and mental disabilities and handicaps. In this program, up to the present, the means used have been radio talks, the distribution of leaflets and phamplets, articles in newspapers, a mental hygiene bulletin, and public addresses.

In March, 1931, a new radio station was started in Albany—Station WOKO, and a period of five minutes one evening a week has since been assigned free to the Department of Mental Hygiene. The mental hygiene talks are of about 600 words. They are written by various members of the Department, by the superintendents of the institutions and by physicians and others on the staff. Each radio talk is mimeographed, and copies are sent to about 600 newspapers in the State on the day it is given over the radio. It is likewise sent to a few special papers like the "United States Daily."

The talks deal with one particular subject only. Some of these topics are: Play for Mental Health; The Causes of Mental Disease; The Quest for Mental Health; Pull Yourself Together; Emotions and Health; Clear Thinking and Mental Health; The Nervous Child; Food for the Mind; and others. Most of these talks have been published in newspapers and at times they have attracted editorial comment. The talks would be well worth while if only for the literature they make available for distribution.

Another method of public education is through leaflets and pamphlets. In 1927 the Department of Mental Hygiene began to

prepare certain leafllets for general distribution. These leaflets are of pocket size and contain about 400 to 500 words each. Some of the titles are as follows: Your Emotions; Behavior Patterns; Accepting Life; Our Children; Sacrifice of the Children; Do Children Inherit Bad Conduct? Facing Difficulties; Face the Future; The Age Misnamed Dangerous; Security and Mental Health; Mental Depression; Mental Disease not a Disgrace; Our Social Inheritance.

Requests for these leaflets have been numerous. In round numbers 47,000 copies of the leaflet, "Your Emotions," have been distributed, 58,000 of "Sacrifice of the Children," 50,000 of "Our Children," and so on. In all, over 518,000 have been distributed up to date.

Aside from these small leaflets, pamphlets of three or four pages of printed matter have been prepared. The department now has 8 such pamphlets. The titles are as follows: Parental Guidance; Epilepsy and Its Treatments; Behavior; Habit-Training; The Treatment of Enuresis; Character Training; The Prevention of Mental and Nervous Diseases; and What May Be Hoped for in the Prevention of Mental Disease. The pamphlets have a less general distribution than the leaflets, 16,000 having been distributed on "Epilepsy and Its Treatment," and 23,000 of "Parental Guidance."

To contrast this distribution with public health literature, the New York State Department of Health distributes more than twice the above totals in one year. It has an assortment of over fifty different leaflets and pamphlets and longer articles. For the year 1930 the Division of Maternal and Child Welfare distributed 403,508 pieces of literature in all. In addition, 455,675 pamphlets, etc., were distributed by the Department of Health on such topics as contagious diseases, tuberculosis, cancer control, etc., making a total of over one million pieces of literature yearly.

The section dealing with social hygiene or venereal diseases of the New York State Department of Health in addition to distributing literature, employed four full-time lecturers who delivered lectures before 115,000 persons in 1930.

In October, 1930, the Department of Mental Hygiene started a bulletin, "Mental Hygiene News." This bulletin of four pages,

published monthly and distributed free, consists as a rule, of two case histories of about one thousand words each, one on child guidance and one on a State hospital case, illustrating certain phases of treatment; an editorial of five hundred words on some topic of general interest; news of the Department, general news items and personal items.

Mental Hygiene News has been sent to State and county health officers, county health nurses, school teachers, social workers and to the State institutions under the Department of Mental Hygiene. The initial circulation was 1,000 and the circulation six months later was 1,900. There have been numerous requests for it, some from abroad. Health News, a similar bulletin, published by the New York State Department of Health, is mailed weekly to about 20,000 persons.

Lectures on mental hygiene often draw large audiences. Their objective should be to bring about some active mental hygiene work in the locality, such as the establishment of a psychiatric ward in a general hospital, the organizing of a child guidance clinic, the employment of a psychiatric social worker, establishment of special classes in schools, or other mental hygiene activity.

A number of other states either through department or committees have used the methods outlined above for public education in mental hygiene. The National Committe for Mental Hygiene has a broad program for public education.

## Organization and Recommendations

What organization is desirable for carrying on this work? Every up-to-date department of health whether State, city or county, distributes public health literature, edits a health bulletin, sponsors lectures on cancer, tuberculosis and other diseases, conducts a campaign for pure food and water and other activities in preventive medicine. The following recommendations are offered in respect to mental hygiene.

Heads of departments, superintendents of institutions, professors of psychiatry and directors of mental hygiene societies should establish the necessary organization in their departments for public education. The movement will then develop as it has in preventive medicine. Organized in this way it will be under the control of authorized persons.

In large mental hygiene departments there should be a separate bureau assigned to the work. Work of such a bureau should consist of preparing and distributing literature, radio talks, the organizing of lectures, etc. This work cannot be done by persons responsible for other duties. To write even a radio talk or small pamphlet requires time and care. Psychiatrists who write scientific articles cannot always be expected to produce, without experience, satisfactory articles for popular education.

Institutions for mental diseases should add a staff for community work and clinics to meet increasing demands. This staff should direct mental hygiene education not as a separate or independent activity, but as one of the activities of the institution. Anyone organizing the various phases of community work which institutions should do, may well read Dr. Adolf Meyer's address given at the First National Congress for Mental Hygiene in Washington in May, 1930, in which he insists upon an integration of all of these various phases of the work as a part of the general psychiatric activities of the institution.

Actual demonstration is in itself a highly important factor in public education. Community clinics held in general hospitals, schools, courts and elsewhere, are of broad educational value.

What results may be expected in mental hygiene education? While a contribution to the philosophy of life, mental hygiene is not a complete philosophy in itself for most persons. Different views are held on international relations, marriage, sex life, crime, education of the young, and other topics. These views depend upon tradition, religious background, the influence of accepted beliefs, parental teachings and other sources. Many of these traditional beliefs, the result of ripe racial experience are of inestimable value to mankind. But recasting some of these is highly necessary. Changes, modifications and complete rejection of some traditions are sure to come, and the known facts of mental hygiene should influence opinions in these fields.

Psychiatry has thrown much light upon the functions of the mind. It has shown influences which go to make up character. It has indicated various factors in the development of intelligence and in what constitutes judgment. It has pointed out how environment, and particular forms of experience and training, modify

mental traits. It has emphasized the importance of sub-conscious mental activity. It has shown how unhealthy tendencies such as the repression of emotions, rationalizing rather than facing facts and long continued mental conflicts are the beginnings of mental maladjustments and at times mental diseases. This knowledge, if rightly applied, should reduce mental maladjustments which lead to psychoneuroses, mental diseases and other incapacities and handicaps.

The teachings of mental hygiene are not beyond the comprehension of most persons. It should be understood so that when these difficulties are seen in a relative, a friend, an associate or a child, there may be a recognition of what should be done. To appreciate minor mental deviations in one's self is always more difficult, but this is also possible. The task of disseminating mental hygiene rests with the supporters of the mental hygiene movement. This paper is offered, not that it contributes many new facts to persons in this audience, but that the subject may be given the consideration it deserves.

## BOOK REVIEWS

**The Mental Defective.** By RICHARD J. A. BERRY, M. D., and R. G. GORDON, M. D. 217 pages. Whittlesey House, McGraw-Hill Book Company, Inc., New York.

It is stated in the preface that the authors realize how difficult a task it is to unfold the intricacies of the structure and functions of the human brain and mind in a small work. The book is the result of a long intensive study of the human brain and a wide and varied clinical experience in mental deficiency.

It may be said at the beginning that the authors look upon the mental defective as a social rather than an educational problem. To them mental deficiency is social inefficiency or social inadequacy.

The Mental-Defective Act of 1913 (England), by its recognition of the fact that mental deficiency is not insanity but is due to the failure of brain development, naturally caused teachers and social workers, as well as the medical profession, to turn their attention to newer methods of exploring the developments of the mind of the child.

After the World War attention was focused on the age-long problem of the mind of man and its disorders. In the words of the British Royal Commission, "Mental deficiency is a state of mental defect from birth or from an early age, due to incomplete cerebral development, in consequence of which the person is unable to perform his duty, as a member of society, in the position of life to which he is born."

The authors then review the fusion of the male and female gametes, the intra-uterine life and the mental condition of the child at birth. They carry their review through to adult life. It is their observation that prior to the onset of puberty, somewhere about the eleventh year of life, there is evidence that the brain growth appears to slow down slightly.

### RESUMÉ OF THE LAWS REGARDING DEFECTIVES AFTER 1899

The law in England recognizes four groups of mental defectives. There is, however, no such natural line of demarcation between defectives as is made by the law. The four types recognized are idiots, imbeciles, feeble-minded and moral imbeciles or moral defectives, for the class which this type seeks to cover, though defective, is not in the imbecile group. There is a very considerable difference between the English classification and that in use in this country. In the former country it appears to be more definitely based upon social inadequacy. The authors quote many authorities both in England and the United States, to show the intimate relation between mental deficiency and such social problems as crime, drunkenness,

prostitution and perverted instincts. Professor W. E. Castle, of Harvard University is quoted, "A self-governing democracy with universal suffrage is seriously threatened by a large increase in the unintelligent portion of its population, and is justified in adopting strong measures to counteract it."

There is no cure for mental deficiency and the fact cannot be too frequently affirmed. In the earlier days, especially in the United States, it was confidently thought that sterilization and segregation would be effective preventive agencies; but subsequent experience has shown that, where both have been tried, they have failed to meet the situation as completely as their proponents expected.

While it is suggested by the authors that they are in favor of sterilization and speak of heredity as being the predominating cause of mental deficiency, they do not definitely ask for a law demanding sterilization. They desire the legalizing of voluntary sterilization as a first step in the control of human breeding from defective stock.

Five great levels of neuronic activity and function can be recognized:

1. The spinal cord activities of the reflex arcs.
2. The medullary-pontine levels of the vital reflexes of circulation, respiration, etc.
3. The thalamo-striate brain, the human and modified equivalent of the reptilian end-brain of reptilian "emotions."
4. The infra-granular cortex of the mammalian brain with its animal functions, and instinctive behavioral reactions.

5th and last, the human supra-granular brain of educability, control, integration, and discrimination.

It is then stated that all mental defectives suffer from an underdevelopment of the fifth and highest of these "brain" levels.

The reviewer does not feel that sufficient proof is furnished to justify this statement. It is evidently felt that there is a well-marked difference in the brain of the normal and the sub-normal child. Premature arrest in the development of the controlling supra-granular brain is thus a fruitful cause in many cases of pauperism, vice, crime and social inefficiency.

Different physical types are described; a diminished physique is noted in two-thirds of the mental defectives considering standards of their social class, sex and grade. Different classes such as cretinoid, mongolian and others are also described.

Mental deficiency, according to the authors, is definitely increasing in England and Wales. This is partly due to the killing off during the war of some of the best breeding stocks of the country. The same results were admittedly present after the Napoleonic wars. Other causes are mentioned:

social legislation and so-called charitable interference with nature, modern sanitary methods and the deliberate restriction in the size of the families in the upper strata.

The authors touch upon almost every phase of social life and its relation to the defective.

In regard to the disposal of the defective, they feel that a great deal of endeavor to train the higher grade defective to occupy a place in the ordinary competitive world is a waste of effort.

Two essentials of a policy are laid down: Recognize the defective, that is, the person who cannot keep up his end in the present-day struggle for existence, and recognize him early. When recognized, place him in an environment where he may lead a useful life, within his limitations.

Colonies are suggested, with a small capital expenditure, an abundance of fresh air, occupation, grading, with permanent staffs, medical and psychological.

In conclusion, this book covers a great many of the social problems caused by the mental defective.

The difference in nomenclature possibly makes it difficult to understand just what group is believed to be unfit for parole and for participation in community life after training.

The reviewer suggests that the authors have paid too much attention to the so-called defective himself without considering in the slightest degree the rapidly changing economic and social conditions which have caused the mental defective to be regarded as a menace.

JAMES L. TOWER.

**Interviews, Interviewers, Interviewing in Social Case Work.** 132 pages. The Family Welfare Association of America, New York.

This is one of the few books on social work in which an effort has been made to analyze processes used in social case work. The interview is the method by which most social work is accomplished or fails to be accomplished; thus an evaluation of the factors involved in this procedure is timely.

The book is made up of a series of articles which have been published from time to time in "The Family." The entire volume is worthy of careful consideration but those on the analysis of the techniques which are used in certain interviews for the accomplishing of specific results will probably be most stimulating to the social worker and of most value to her in taking stock of her own methods and her own approach.

It is time for social workers to tell what they do and insofar as possible, how they accomplish their purposes. Stray articles here and there have attempted this for some time. This book which has assembled some of the best of these is a welcome addition to the library of any one interested in social work.

HESTER B. CRUTCHER.

**Personality and Social Adjustment.** By ERNEST R. GROVES. 2nd edition. 308 pages. Longmanns, Green and Co., New York.

The author feels that the success of science in gratifying man's material interests led naturally to the scientific study of man himself.

This is seen in the function of the school socially which is to influence the conduct of those who are soon to be citizens, responsible for public welfare.

Parents also are looking for help. They demand concrete, specific and clear assistance.

In the chapters on impulse and social control, conditioned reflexes are dealt with along conventional lines. The inhibitions placed upon a child may crush his emotional life, although the necessity for different restraints are noted.

Education is looked upon as being made up of everything that registers in the life of the individual.

The contents of the book include many interesting chapters dealing with impulse and social control; emotional basis of social conflict; the social significance of fear, anger, sex, gregariousness and self-assertion; the inferiority complex and social behavior; phantasy and social rationalization; authority and individuality; abnormality and social conduct.

The author explains that the psychiatric use of the term inferiority complex restricts it to a chronic, deep-seated neurotically inclined inferiority feeling. It is fortunate that this statement was made, otherwise many readers might get an exaggerated and distorted view of the importance of those feelings of inferiority which naturally are felt at times by every individual.

It is pointed out that if a child shows continuously symptoms of a feeling of inferiority, it is important that he be led away from any compensation which he may be obtaining from phantasy. He needs an opportunity to taste success.

Mental disorders such as schizophrenia and manic-depressive states are discussed with strong emphasis on prevention based upon mental hygiene and the making of a good adjustment to life.

There is an appendix of topics for discussion and reports, also an inclusive bibliography.

This book should have considerable value as a textbook.

JAMES L. TOWER.

**The Psychology of Exceptional Children.** By NORMA V. SCHEIDEMANN, Ph. D. Houghton, Mifflin Company, Boston, Mass.

Teachers and others interested in the education and training of children will find this comprehensive textbook of great value. Pedagogical practice was long based upon the belief that except for extreme and therefore obvi-

ous cases, children in the mass might be treated as though there were no individual differences. Some pioneer studies of such physical characters as height and weight aroused doubts concerning this assumption, but it was not until Binet and Simon completed their researches on the measurement of general intelligence that the study of individual differences began to flourish. Studies of general intelligence were quickly followed by investigations into the prevalence and variety of specific abilities and traits of various kinds. The literature on individual differences grew to enormous proportions, and as it was scattered widely through innumerable journals, the task of gathering and arranging the material in logical order must have been a considerable one, and therefore represents, in itself, an important contribution to the literature of individual differences.

Two important conclusions, both affecting educational practice, have grown out of the study of individual differences. In the first place we have learned to recognize not only defect but also superior ability. Slowly, but surely, are we beginning to make provision for the development of children with a high order of native ability. In the second place, we now recognize that most, if not all, human traits and abilities are so distributed that no sharp line can be drawn at any point dividing the group into normal and subnormal. We can, however, divide the range into intervals which shall include children who are relatively homogeneous and thus facilitate the practice of classroom teaching.

It is the advisability of determining such groups which makes Dr. Schiedemann's text on the Psychology of Exceptional Children of invaluable assistance to the teacher. The book is a very comprehensive review of the significance of trait differences, and of the methods of measuring such differences. The groups of exceptional children include the following: Major and minor speech disorders, the left-handed child, the mentally defective child, the gifted child, the psychoneurotic and psychopathic child, the deaf child, the blind child, the congenitally word-blind child, the delinquent child, and a few special types, such as the epileptic child. Some chapters receive very extensive treatment as in the case of speech disorders, and left-handedness. In others, as in the chapters on the psychoneurotic and psychopathic children, the treatment is somewhat fragmentary, but this may be due in part at least, to the greater difficulties in the diagnosis and treatment of such conditions. It would appear preferable not to stress the latter subjects in a textbook intended primarily for teachers, as it is more desirable to place the treatment of problem children in the hands of specialists.

The field covered in the study of individual differences is very great, and it is therefore difficult to treat each subject at length. Furthermore, new

knowledge is being accumulated very rapidly. Consequently, some statements appear to be too dogmatic and it is well to call attention to them. In the first place there is a constant appeal to the normal curve. Distributions of scores of general intelligence are said to be normal, apparently on the sole ground that they look so. This is dangerous statistical procedure, as, without exact statistical criteria, we cannot tell whether a frequency distribution is normal or not. The normal curve has become almost a dogma, and in some cases of standardization it appear as though tests were arbitrarily arranged so as to produce such a distribution. Now in theory, at least, there are good reasons for believing that the distribution of intelligence is skewed, and that the average is nearer the lower rather than the higher limit of intelligence. However, whatever one's opinion on this difficult subject, we should agree that further investigation is needed before we state definitely that intelligence is distributed in a normal manner.

There is a frequent effort to explain the inheritance of intricate human traits by an appeal to simple Mendelian ratios. Remembering that Morgan and his associates have found it necessary to devise complicated formulae for the description of the inheritance of eye color in the fruit fly, why should we assume that so complicated a phenomonen as human intelligence or mental disease can be explained in far simpler language. There are also dogmatic assertions with respect to the inheritance of acquired characteristics. In view of the grave doubts concerning some of Kammerer's experiments, it appears desirable to eliminate such references.

In the chapter on epilepsy, Caesar, Napoleon and Flaubert are referred to as epilepties who achieved greatness. The evidence on this point (which is not summarized in the text) is extremely fragmentary, and it is fair to add that weighty authorities, such as Havelock Ellis, do not admit the accuracy of the diagnoses of epilepsy. The percentage of cases of epilepsy ascribed by the author to heredity greatly exceeds the estimates reported annually at Craig Colony.

These criticisms, however, do not touch upon the principal themes of the book and therefore do not detract from its great merits. It will undoubtedly remain for some time the leading compendium on the literature dealing with the traits and abilities of exceptional children.

MALZBERG.

**Behavior Disorders Following Encephalitis.** By EARL D. BOND, M.D., and KENNETH E. APPEL, M. D. Published by The Commonwealth Fund Division of Publications, New York City.

This is a 160-page monograph comprising eight chapters and an appendix of 48 case summaries presented in tabular form. In the introduction the authors clearly indicate that the organization of a hospital school for chil-

dren presenting personality changes with epidemic encephalitis was in the nature of an experiment to determine the value of group treatment under psychiatric direction and to evaluate the part played by factors other than the encephalitic process itself in the emotional disturbances. The reviewer can heartily endorse the idea of the authors, as stated in the introduction, that the method of treating post-encephalitic behavior disorders may in principle be applied to other similar, but differently determined, personality problems in children. The monograph is based on a study of methods used and results obtained in the treatment of 62 problem children, all under 12 years of age, 48 of whom were encephalitics, during a period of approximately five years.

The first two chapters are devoted largely to a brief discussion of epidemic encephalitis and a description of the ensuing personality and behavior disturbances. Chapter III describes in detail the organization of the hospital school at the Pennsylvania Hospital. This description takes into account the physical layout of the building, exercise grounds, school rooms, camp, daily schedule of activities, and personnel, all of which is exceedingly important and even the minutest detail may not be overlooked.

Chapter IV stresses the importance of the attitude of all the personnel involved. Objectivity, patience and positive habit training are emphasized. Many practical suggestions are given. Chapter V is a continuation, in a certain sense, of Chapter IV and discusses the importance of establishing rapport between children, nurses and doctors with many practical suggestions as to how this may be accomplished. Chapter VI again is a continuation of the discussion of hospital schedules and activities and personal relationships in the treatment of the problems of behavior. General procedures such as schedules, physical treatment, suggestion, deprivations and many others, each of value if intelligently applied, are discussed in clear, simple terms.

Chapter VII discusses the effects of treatment as described in the foregoing chapters. Briefly, of 48 post-encephalitic children, all but 2 showed improvement while in the hospital. "Of 20 post-encephalitic cases sent home, 7, or 35 per cent, made a good adjustment."

In Chapter VIII, the concluding chapter, the authors discuss, among other things, the application of the hospital school method to other types of behavior problems in children.

The reviewer feels it a privilege to endorse this monograph to any person or group of persons who are charged with the responsibility of treating problem children, regardless of the primary origin of the personality difficulties. It is seldom that we are privileged to have passed on to us, almost at first hand, such a simple, direct, practical treatise on behavior problems in children so entirely free from impractical, "arm-chair" platitudes.

H. W. POTTER.

**Abnormal Psychology.** By H. L. HOLLINGWORTH. 572 pages. Psychology Series. The Roland Press Comp., New York.

In this book Dr. Hollingworth presents in non-technical language the concepts and theories of abnormal human conduct and behavior. The book falls into two distinct parts. In the first part comprised of seven chapters he traces the various trends in the interpretation of behavior abnormalities from antiquity to the present. The contemporary schools he classifies under the neuro-anatomical; physiological, "psychoanalogical" and the psychological. The second part, comprised of 18 chapters, he devotes to a descriptive and interpretive account of the chief categories into which personalities may fall. Two chapters are devoted to feeblemindedness, eleven to the psychoneuroses and one to each of the following: aphasia, epilepsy, psychopathic personality, and two to the major psychoses.

The book is apparently intended as a text for college students in a course of abnormal psychology which the author has conducted for a number of years. The book fulfills that purpose admirably. It is written in a clear and lucid manner and introduces the subject matter to the novice in a logical and comprehensive way.

In previous publications, i. e., "The Psychology of Functional Neuroses" the author has advanced the theory of "redintegration." This formula he expands in this book to apply to all other mental disorders. "Mental activity whether normal or abnormal is seen to be characterized in its most general terms by the redintegrative sequence. Partial stimuli now occuring function for former antecedents of greater complexity. This is the general pattern of mental activity."

The two outstanding features of mental activity are learning and sagacity. To distinguish the relevant from the irrelevant aspect of a complex object or situation implies sagacity. The characteristic of the neurotic is that he is defective in such sagacity; by reason of this defect he is more liable than the normal man to such redintegrative reactions and this is the essence of the neurotic constitution.

The difference between the psychoneurosis and the psychosis is: "The psychoneurosis is the redintegrative production on the basis of unsagacious comprehension of relatively transient postural autonomic or symbolic response. In the two major functional psychoses instead there is a chronic reinstatement by a similar mental mechanism, of a prolonged autonomic, affective or emotional state which is an enduring mood."

The feebleminded show a redintegrative inaptitude, an inability to react to reduced stimuli or partial cues and signs of past events.

The author in his search for an adequate scientific explanation of human behavior has taken recourse to his all-embracing master principle of redin-

tegration since he finds the other theories wanting. The neuroanatomical and physiological were insufficient to explain the psychological aspect, while the Freudian school, which he chooses to designate as the "Psychoanalogical," he rejects because it is based primarily upon figures of speech rather than upon scientific experimental data. The author feels that descriptive psychology is adequate to explain most of the facts without taking recourse to the "notions" of psychoanalysis.

The reviewer cannot resist the temptation of making use of an aphorism accredited to Dr. Joseph Collins. Psychoanalysis may not be scientific but has a good deal of common sense, while behaviorism which is clothed in scientific terms, totally lacks common sense.

Is not the conditioned-reflex the father principle of both behaviorism and redintegration?

KATZ.

**Psychological Service for School Problems.** By GERTRUDE H. HILDRETH, Ph. D., Associate in Research and Pathologist, The Lincoln School of Teachers College, Columbia University. 317 pages. Measurement and Adjustment Series, World Book Company, Yonkers-on-Hudson, New York.

This book is primarily arranged for the use of school administrators and students of school psychology. It does, however, indicate school problems to those offering child guidance to school children but not connected with the schools. The arrangement is that of a text with questions and exercises included at the end of each chapter. For reference there is an adequate topical bibliography including names of publishers and a table of tests arranged according to topics and age or grade groups for which the tests are suitable. As a text the book presupposes psychometric and statistical training acquired elsewhere, and has as its aim clarifying of problems to the psychologist and educators, at the same time stressing the need of training.

The field outlined is broad. Testing is a small part and the author in most cases implies assistants for much of this work. Problems referred by teachers and school administrators may include: Test-making; planning testing programs; pupil classification; parent education; accumulating statistical data for case studies; discovering, motivating, and directing research problems; diagnosing and directing remedial work for individual cases as well as special classes. Aside from these the psychologist is expected to cooperate with social agencies working with problem children in the school. The training recommended by the author rightly stresses the educational side of preparation; but it is questionable whether she is justified in stating that a child's emotional and social problems may be solved by

only physical and educational approaches, and hence expecting the school psychologist to diagnose and make recommendations for problem children with emotional and behavior difficulties without the aid of a psychiatrist and with the bare minimum of training in the fields of abnormal psychology and mental hygiene.

A. W. GODDARD.

**The Dependent Child.** By HENRY W. THURSTON. 324 pages. Columbia University Press, 1931.

If one is looking for a book on the techniques of child placement, one would not consult Mr. Thurston's book. If, however, he is looking for an interesting history of the care of the dependent child from the days of Queen Elizabeth to the present time, he will find this briefly but interestingly given.

Mr. Thurston tells vividly of the life of the children in almshouses in the early days; then as it began to be realized how detrimental this influence was to the children, orphanages developed first from private contributions. As he expresses it, "heart action" was the basis of these pioneer efforts. The non-individualized type of life in the orphanages did not seem to permit the child to develop along desirable channels. This, coupled with the fact that the orphanages were full to overflowing, caused the taking of children around the country and more or less auctioning them off for adoption. Anyone who was duly recommended, was allowed one of these children for adoption. This was probably the beginning of free foster home placement, aside from the early apprenticeship type of placement. Inasmuch as many of the children so placed were not heard of again by the orphanages, follow-up work was instituted and in this way case work in child placing gradually developed.

Mr. Thurston points out that there are still orphanages where a rigid atmosphere predominates. There are also children given out either in free foster home placement or for adoption where it seems obviously detrimental to the child, but there are also progressive child placing institutions where the child is considered as "a total personality in a total situation," and an effort made to work out his life accordingly.

Case material presents the question of maintaining the child's own family ties as balanced against what would seem more advantageous adoption, which is one of interest to every child placing agency. The necessity for child placing arises almost entirely from the broken home—a situation all too frequently following the mental illness of one of the child's parents, hence this book will be of special value to the social worker in the State hospital—and any socially-minded person will find it interesting.

HESTER B. CRUTCHER.

**Married Love.** By Dr. Marie Carmichael Stopes. 160 pages. G. P. Putnam's Sons, New York.

It is well known that unhappy married life is a factor in the etiology of the neuroses and of some other forms of mental disease. Among the many causes of marital infelicity sex maladjustment is probably of primary significance. Difficulties in this field are rarely discussed, even with the family physician, unless some serious illness brings them to light.

In this well-written book, Dr. Stopes makes a noteworthy contribution to the happiness of the married state. The problem of the sex adjustment of husband and wife is fully and frankly discussed and many important suggestions are made for the promotion of their mutual satisfaction and well-being.

Strange to say, this book, which has gone through 19 editions in England, was for several years excluded from this country by the Federal custom authorities. It was not until April 6, 1931, that its sale in the United States was legally authorized by a court decision rendered by Judge John M. Woolsey of the U. S. District Court.

The following excerpt from the judge's opinion is an excellent characterization of the book:

"Whether or not the book is scientific in some of its theses is unimportant. It is informative and instructive and I think that any married folk who read it cannot fail to be benefited by its counsels of perfection and its frank discussion of the frequent difficulties which necessarily arise in the more intimate aspects of married life, for as Professor William Sumner aptly used to say in his lectures on the Science of Society at Yale, marriage, in its essence, is a status of antagonistic cooperation.

"In such a status, necessarily, centripetal and centrifugal forces are continuously at work, and the measure of its success obviously depends on the extent to which the centripetal forces are predominant.

"The book before me here has as its whole thesis the strengthening of the centripetal forces in marriage, and instead of being inhospitably received, it should, I think, be welcomed within our borders."

POLLOCK.

**Essentials of Psychiatry.** By George W. Henry, M. D., Assistant Professor of Psychiatry, Cornell Medical School; Director of Clinical Research, Bloomingdale Hospital. With introduction by Thomas W. Salmon. Second edition. 304 pages. Price $4.00. Baltimore. The Williams and Wilkins Company, 1931.

Dr. Henry's book has had a good reception; the first edition, published about seven years ago, was reprinted in 1928. The new edition has been practically rewritten though the author has adhered to the general plan of

the earlier edition and the chapter captions to a large extent have been retained. The text has been expanded and improved, for example—chapters 4, 5, 6, 7 and 8, which are particularly to be commended in their new form. One chapter captioned "Special Precautions and Emergencies" has been omitted and the material distributed to other chapters, particularly in that one devoted to psychiatric nursing, and a new chapter, "Psychiatry in General Hospital Practice" has been added.

The changes that have been made have added to the accuracy of the author's presentation and to its value. The improvement is especially to be observed in his interpretation of symptoms and trends in the discussions which follow presentation of clinical material. Dr. Henry is to be congratulated upon having prepared a well rounded and well balanced book in that the subject is presented without unnecessary elaboration and yet there is sufficient detail to make it of value to medical students and the general medical reader.

HUTCHINGS.

**Health and Hospital Survey, Kansas City, Missouri.** Made in 1931 for the Chamber of Commerce of Kansas City by a survey staff of the American Public Health Association and the Kansas Public Service Institute.

The social survey has become an invaluable instrument in community stock-taking. As in private enterprise it not only provides an accurate picture of the present situation, but it furnishes the starting point for future development. Such self-analysis has been developed to a high degree in the United States, and is an excellent example of the significant contributions to the public welfare that flow from the application of trained, private initiative to public problems.

The Health and Hospital Survey of Kansas City is a good illustration of the social survey. It was undertaken by the Committee on Administrative Practice of the American Public Health Association and the Kansas City Public Service Institute on the invitation of the Public Health and Welfare Committee of the Chamber of Commerce of Kansas City. The survey was asked to answer questions relating to the adequacy of public health activities, the sufficiency of financial support, the relations of public and private health agencies, the size of the death rates, the organization of public health agencies, and the economic loss due to morbidity and mortality. It was also asked to outline a health program for the next ten years.

The thoroughness of the investigation is evidenced by the size of the report, which comprises a volume of over 300 pages. The survey was divided into three parts. The first part begins with a description of public and

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private health facilities, and the organization and use of vital statistics. Detailed studies are then presented of communicable diseases, venereal disease, tuberculosis, maternal and child hygiene, school hygiene, public health nursing, heart disease, cancer, the control of milk, milk products and food, general sanitation, mental hygiene, laboratory service, industrial hygiene, and health education. The second part is a detailed study of the care of the sick in hospitals and out-patient departments. The third part considers the three tax-supported hospitals in Kansas City.

The survey reports that health facilities in Kansas City are less than 70 per cent adequate, as judged by accepted standards. The failure is ascribed in large part to the neglect of the city health authorities to assume proper leadership. This in turn is attributed to insecurity in the tenure of office. Criticism is also directed at the failure to build health programs upon the basis established by the vital statistics of Kansas City. The Survey recommends the organization of a health council to represent the city departments of health and education, the medical societies and the voluntary health agencies. The health department is urged to start a program of health education. It is also recommended that the health department take over certain functions, at present largely in the hands of private organizations.

It is recommended that the hospitals become, in a sense, health centers, from which would radiate educational health activities. A large program directed toward the development of hospital social service is also recommended. Specific recommendations are made for improving the service rendered in the tax supported hospitals, with special emphasis on the necessity of revising the resident medical staffs so as to provide continuous control of each service throughout the year.

Reference should be made to the complication in health problems resulting from the presence of a large negro population. Sickness and death rates in this group exceed greatly those in the white population. The result is that whereas the white population is able to grow through the excess of births over deaths, the colored population, because of excess of deaths over births, has to be recruited by migration.

The report recognizes the significance of mental hygiene in a program of public health and surveys the facilities for the treatment of mental disorders in Kansas City. There is no institutional care, other than that provided at the state hospitals. In this connection the report includes the following hibernicism. "The extent of care of mental disease . . . agrees favorably with the tentative standards of 300 institutional patients per 100,000 population, though the number of new admissions is little more than half the standard of 90 which the experience of a considerable number of institutions

would indicate was desirable.'' (p. 161). Out-patient clinic service is provided by the psychiatric and neurologic divisions of six hospitals. A child guidance clinic is conducted in cooperation with the Mental Hygiene Society of Kansas City. The public schools operate a psychological clinic for mentally handicapped children. There are opportunity classes and ungraded classes for children with varying degrees of intellectual retardation. Community education is conducted by the Kansas City Mental Hygiene Society through public meetings. The survey recommends an increase in the number of beds for patients with mental disease and mental defect, and the development of out-patient clinic service.

The Health and Hospital Survey of Kansas City is a contribution to social science and is worthy of study by all students of public health.

MALZBERG.

## CHANGES IN COMPOSITION OF POPULATION OF STATE IN RELATION TO RATES OF MENTAL DISEASE

The results of the census of population taken on April 1, 1930, indicate changes in the population of the State of New York which are significant with respect to future trends in mental disease. The total population increased from 10,385,227 in 1920 to 12,588,066 in 1930, an increase of 21.2 per cent. If, instead of increasing, the rate of first admissions to all institutions for the treatment of mental patients had remained at the same level as in 1920, there would nevertheless have been an increase in first admissions in 1930 amounting to 1,541 patients. The white population increased from 10,172,027 in 1910 to 12,150,293 in 1930, an increase of 19.4 per cent. Negroes increased by 108.0 per cent growing from a total of 198,483 in 1910 to 412,814 in 1930. As the rate of first admissions is greater among negroes than among whites, the rapid growth of the negro population will tend to increase the rate of first admissions for the State as a whole. The native white population increased by 21.3 per cent, compared with an increase of 14.6 per cent among foreign-born whites. This should tend to reduce the rate of first admissions. The native whites of native parentage increased by 22.0 per cent, compared with an increase of 20.6 per cent among native whites of foreign or mixed parentages. As the native whites of native parentage have the lowest rate of first admissions among the several nativity groups, their more rapid growth should have a favorable influence upon the future trend in the rate of first admissions for the State as a whole. However there is a counteracting influence in the continued growth of the urban population which increased from 8,589,844 in 1920 to 10,521,952, an increase of 22.5 per cent; the rural population grew from 1,795,383 to 2,066,114, an increase of only 15.1 per cent. Another unfavorable influence upon the trend of first admissions is the increase in the average age of the population. In 1920, 37.4 per cent of the population was aged 35 years and over, whereas in 1930 the corresponding percentage was 39.8.

UNIV. OF MICH.

DR. WILLIAM J. TIFFANY

## DR. TIFFANY BECOMES SUPERINTENDENT OF PILGRIM STATE HOSPITAL

Dr. William J. Tiffany, who had been superintendent of Kings Park State Hospital since October 20, 1926, was transferred to the superintendency of the new Pilgrim State Hospital, located near Brentwood, Long Island, November 16, 1931.

Dr. Tiffany entered the New York State Hospital service as clinical assistant at the Binghamton State Hospital during the summer of 1904. After completing his medical courses at Columbia University in 1905, he became house physician and surgeon of St. Joseph's Hospital, Paterson, N. J. Dr. Tiffany re-entered the State hospital service as medical interne at the Binghamton State Hospital, July 6, 1906. He was appointed second assistant physician at Matteawan State Hospital, August 22, 1911, but later in the same year returned to Binghamton State Hospital as pathologist. Dr. Tiffany became clinical director of Kings Park State Hospital in September, 1922, and superintendent in 1926.

The new Pilgrim State Hospital, which when completed will be the largest of its kind in the world, is named in honor of Dr. Charles W. Pilgrim, formerly superintendent of the Hudson River State Hospital, and at one time chairman of the State Hospital Commission.

# NOTES

—The winter meeting of the American Association for the Advancement of Science was held in New Orleans from December 28, 1931, to January 2, 1932. The program included a session on mental disorders which was held under the joint auspices of the sections on psychology and medical sciences.

—The tenth International Congress of Psychology will take place in Copenhagen from August 22 to 27, 1932. Announcement is made of subsequent tours to psychological institutions in Denmark, Germany and Austria.

—The ninth annual meeting of the American Orthopsychiatric Association will be held in Baltimore, Maryland, February 18-20, 1932, under the presidency of Dr. Augusta F. Bronner, assistant director of the Judge Baker Foundation. Dr. Ralph P. Truit is chairman of the committee on arrangements.

—Dr. Swepson J. Brooks died November 25, 1931. Dr. Brooks was proprietor and physician in charge of Dr. Brooks' House, a private sanitorium at Rye, New York. He was commissioned major in the Medical Corps during the World War, and subsequently was one of the organizers, and the first commander of the Carl Anderson Post, No. 599 of the American Legion.

—Dr. Frankwood E. Williams who had been editor of Mental Hygiene for 15 years retired from the position December 31, 1931. He was succeeded by Dr. C. M. Hincks, general director of the National Committee for Mental Hygiene. Dr. Hincks will be assisted by an advisory editorial board consisting of Drs. Howard W. Potter, Edward A. Strecker, Sheldon Glueck, and Horatio M. Pollock.

—In the October, 1931, issue of THE PSYCHIATRIC QUARTERLY it was erroneously stated that the New York Psychiatric Institute located at 324 West 88th Street was formally opened September 15, 1931. The correct name of the new organization is the Psychoanalytic Institute. This institution has no connection with the Psychiatric Institute and Hospital operated in New York City by the Department of Mental Hygiene.

—According to the Welfare Bulletin published by the Illinois State Department of Public Welfare, the inmates of the Joliet Penitentiary were recently given intelligence tests. The results disclosed that 4.5 per cent were of very superior intelligence; 9.4 per cent of superior intelligence; 16.9 per cent high average; 29.9 per cent, low average; 12.2 per cent inferior and 6.9 per cent very inferior.

—The Psychiatric Bureau of New York City announces a specialized service in providing trained personnel for the care of private mental patients in their own homes. It cooperates with psychiatrists, neurologists and general practitioners. It also conducts a placement service for retarded or problem children and maintains a personnel, placement and advisory agency for psychiatric nurses. The bureau is in charge of Miss Adele Poston.

—At the recent meeting of the Clinical Congress of Surgeons in New York City, Dr. Charles H. Mayo emphasized the fact that science has almost reached the limit in the possible extension of the expectation of life through the control of epidemic diseases. In the future the *individual* must learn to practice the principles of personal hygiene in their physical and mental aspects. Dr. George W. Crile stressed the same point of view by describing the interdependence of mental and bodily functions.

—The new psychiatric clinic of the Court of General Sessions in the county of New York was formally opened on December 23, 1931. The ceremony included addresses by Mayor Walker, Dr. Menas S. Gregory, director of the division of psychiatry of the Department of Hospitals of the City of New York, and Judge Cornelius F. Collins of the Court of General Sessions. Dr. Gregory will be in charge of the clinic until its organization is completed.

—A notable increase in expectation of life since 1910 is indicated by data set forth in a recent bulletin of the Metropolitan Life Insurance Company. In 1911-1912 the industrial policy holders of the company had an expectation of life at birth of 46.63 years. In 1919-1920, this had increased to 51.14 years. In the following decade there was a further increase, the expectation reaching 57.36 years in 1930. This represents a gain of 10.73 years since 1911-1912.

—United States Veterans Hospital, No. 81, located in the Bronx, New York City, has been transformed from a hospital for the treatment of psychotic patients to a general medical and surgical hospital. All psychotic patients have been transferred to other institutions. The license granted to the United States Veterans Bureau to conduct such hospital as a private institution for the treatment of mental patients was cancelled by he Commissioner of Mental Hygiene as of January 1, 1932.

—The 17th annual national conference of Catholic Charities was held in Wilkesbarre, Pennsylvania, September 27-30, 1931. The conference included sessions on mental hygiene which were arranged by the Conference Committee on Health, of which Dr. Henry C. Schumaker, director of the Cleveland Child Guidance Clinic, is chairman. Papers were read by Dr.

John D. O'Brien, of Canton, Ohio, who stressed the need of psychiatric wards in general hospitals; and by Dr. Thomas W. Moore of Washington, D. C., whose subject was "Pastoral Mental Hygiene."

—At the International Hospital Congress in Vienna in the summer of 1931, a session was devoted to psychiatry and neurology. The principal paper, by Dr. W. Alter of Düsseldorf, reviewed the recent progress in the treatment of mental and nervous disorders and discussing its relation to practice in the general hospital. An outcome of the congress was the formation of an International Hospital Association of which Dr. René Sand of Paris was elected president and Dr. E. H. Lewinski Corwin of New York City, secretary general.

—Official recognition of the classification of mental diseases adopted by the American Psychiatric Association and used by all hospitals for the treatment of mental diseases in the United States, has been given by the Province of Quebec, Canada. Beginning January 1, 1932, the classification is to be the only official one in use in the mental hospitals in the Province. A manual giving the complete classification with explanatory notes has been prepared in French. The use of the uniform classification by the Canadian provinces marks an important forward step in the collection of international statistics of mental disease.

—A laboratory for child research has been established at Mooseheart, Illinois. The Loyal Order of Moose, a large fraternal organization presided over by U. S. Senator James J. Davis, maintains the laboratory in conjunction with a home for dependent children of deceased members. The plans for the laboratory were developed by a group led by Dr. E. A. Doll, of the Vineland Training School. Problem children at Mooseheart will be studied in the laboratory by a psychiatrist, a clinical psychologist, and a social worker. Two cottages will be set aside for the re-education of problem children.

—The National Committee for Mental Hygiene held its annual meeting in the Nelson Tower Building, 450 Seventh Avenue, November 12, 1931. The meeting was limited to members of the committee. Addresses were made by Dr. C. M. Hincks, Dr. Ralph A. Noble and Clifford W. Beers. Officers for the coming year were elected as follows: Honorary president, Dr. William H. Welch of Baltimore; president, Dr. Charles P. Emerson of Indianapolis; vice-presidents, President James R. Angell of Yale University, Dr. William L. Russell of New York, Dr. Bernard Sachs of New York; general director, Dr. Clarence M. Hincks; treasurer, Frederic W. Allen of New York; and secretary, Clifford W. Beers of New York.

—A conference on nursing and mental hygiene was held at the Pennsylvania Hotel, New York City, October 16-17, 1931, under the auspices of the National Committee for Mental Hygiene. The conference was attended by directors of nursing schools, officials of nursing organizations, and other leaders in the field of nursing. The speakers all emphasized the necessity of training the nurse in the principles of mental hygiene in order that she may have a more thorough knowledge of the motivations of human behavior and be better equipped to treat the patient as an individual. Dr. William L. Russell and Dr. Richard H. Hutchings discussed the nature and the needs of State hospital training schools for nurses.

—The twelfth annual meeting of the Association for Research in Nervous and Mental Diseases was held in Hotel Commodore, New York City, December 28 and 29, 1931. The general theme discussed at the meeting was "Infections of the Central Nervous System." The sessions of the first day were devoted to a symposium on "Poliomyelitis and Epidemic Encephalitis;" those of the second day to a symposium on "Meningitis."

In the discussion of the treatment of infantile paralysis some of the clinicians held that the serum treatment was proving efficacious while some of the laboratory research workers maintained that the matter was still in doubt. The president of the association was Dr. Israel Strauss, and the secretary-treasurer, Dr. Thomas K. Davis. The chairman of the Program Committee was Dr. Frederick Tilney.

—According to the Statistical Bulletin of the Metropolitan Life Insurance Company for November, 1931, there was a total of 13,091 cases of poliomyelitis reported last year up to October 17, 1931, in 19 states with an aggregate population of over eighty million people. There was a sickness rate of 21 cases per 100,000 population, the greatest since 1916, when the sickness rate was 53.3 per 100,000. The outbreak in 1931 was not only smaller than that in 1916, but also less virulent. For the states reporting deaths and cases in 1916 and 1931, there were 10.3 deaths per 100 cases in 1931, compared with 26.2 in 1916. Connecticut had the highest sickness rate in 1931, 78.9 per 100,000. Brooklyn led the cities with a rate of 94.5 per 100,000. The latter city had a rate of 224 per 100,000 in 1916, which was the highest incidence rate in that year.

—The American Statistical Association at its ninety-third annual meeting held in Washington December 28-30, 1931, for the first time in its history, devoted a session to the discussion of mental disorders. Papers were presented as follows:

"Life Tables for Patients with Mental Disease," Benjamin Malzberg, New York State Department of Mental Hygiene.

"Alcoholic Mental Disease Before and After Prohibition," Frederick W. Brown, National Committee for Mental Hygiene.

"Economic Loss to New York State and the United States on Account of Mental Disease," Horatio M. Pollock, Director, Statistical Bureau, New York State Department of Mental Hygiene.

Mr. Malzberg's paper was discussed by Elbertie Foudray, Mr. Brown's paper by Ellen Winston, and Dr. Pollock's paper by Dr. Royal Meeker.

—Recognizing that the great dearth of trained psychiatrists is probably the most serious problem in the field of mental hygiene, the National Committe for Mental Hygiene has undertaken to meet the situation by creating a new Division of Psychiatric Education. Financial support for the activities of the division during its first year has been obtained from the Commonwealth Fund, the New York Foundation, and the American Foundation for Mental Hygiene. The division will endeavor to strengthen the courses in mental and nervous diseases included in the curricula of medical schools and hopes thereby to attract an increased number of medical students to the pursuit of psychiatry as a profession, and also to impart a better knowledge of mental diseases to the general practitioner. The work of the Division of Psychiatric Education is to be directed by Dr. Ralph A. Noble of Sydney, Australia, and Dr. Franklin G. Ebaugh of Denver, Colorado.